Specialized Oil Publications of
THE GULF PUBLISHING COMPANY

The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipeline industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

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LOOKING AHEAD
... with the Editor

RISING military requirements for petroleum products have necessitated the production, refining and transportation of record-breaking quantities of oil during the first six months of 1944, making the period one of the most eventful in the industry's history. For this reason, THE OIL WEEKLY's Mid-Year Statistical Number, to be published next week, will be of more than usual interest.

The issue will present data on consumption, production, refining, drilling and discovery rates for the first half of the year, and in comparison with previous periods. Thus, it will constitute an interpretative analysis of trends for the industry's principal operations.

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THE OIL MAN'S CALENDAR

JULY 25–26	IPAA Meeting of Executive Committee and Vice Presidents, Fort Worth.
OCT. 3– 4	American Association of Oil Well Drilling Contractors, Blackstone Hotel, Fort Worth.
12–13	Texas Mid-Continent Oil & Gas Association, Houston.
23–25	Fifteenth Annual Meeting, IPAA, Dallas, Texas.
NOV. 13–16	American Petroleum Institute, Stevens Hotel, Chicago.

THE OIL WEEKLY

ENGINEERING • NEWS • STATISTICS

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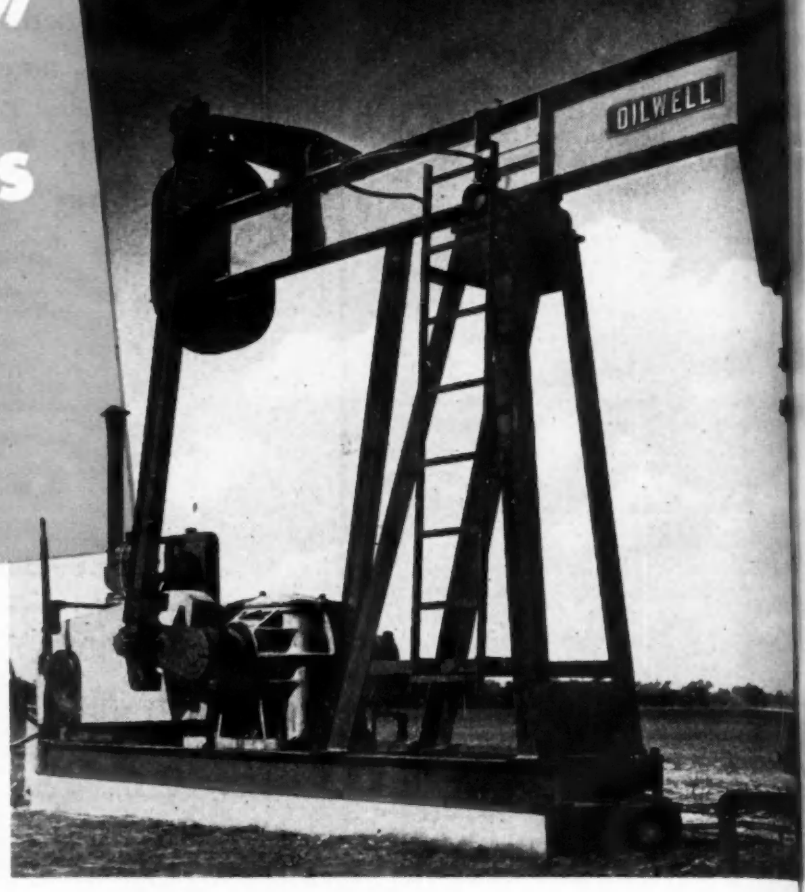
HOW "Oilwell" PUMPING UNITS meet CHANGING CONDITIONS



"OILWELL" TC-12C Twin-Crank Pumping Unit for medium-duty service provides many of the high-quality features ordinarily expected only in heavy-duty units. These include the "Oilwell" knuckle-joint unitized pitmans and self-aligning wrist-pin bearings which make it easy for one man to change stroke lengths to meet varying pumping conditions.

TO perform satisfactorily over the life-cycle of a well, a pumping unit must have a wide range of operating flexibility. It must be a smooth-running pumping unit which can be counterbalanced easily and quickly. The unit must be vibrationless at all speeds and have a simple method of changing stroke lengths. "Oilwell" pumping units meet these and other requirements.

Advantages of "OILWELL" Pumping Units

Easy and effective counterbalancing. "Oilwell" Type "B" Adjustable Counterweight Cranks are standard equipment on all heavy-duty units and the TC-12H and TC-17C medium-duty units. All other medium-duty units have counterweight cranks and are also equipped for beam counterbalancing. The light-duty units are counterbalanced by means of beam weights. It is necessary to purchase only enough counterweights to suit individual well conditions.

Wide speed range. Inherent stability, ample strength throughout, and accurate counterbalancing make it possible to operate "Oilwell" pumping units safely over a wide speed range.

Wide selection of stroke lengths. "Oilwell's" self-aligning crankpin bearings and knuckle-joint pitmans facilitate adjusting stroke lengths in the field.

Adaptable to temporary or permanent foundations. The strength and rigidity of "Oilwell" pumping units make them adaptable to temporary wood foundations or permanent foundations which require a minimum of concrete.

Portable. Deep structural-steel base beams facilitate field-transportation and installation. The wide base construction minimizes the tendency to turn over when loading or unloading.

Adaptable to a variety of prime movers. Universal slide rails make it easy to install various types, makes and sizes of prime movers. The flywheel-type pulley smooths out torque peaks and prevents excessive load fluctuations.

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Wide range of sizes and types. Maximum economy for a great variety of pumping requirements is provided for by the wide selection of pumping units in the complete "Oilwell" line. Please refer to pages 2254-2257 in the 1943-'44 COMPOSITE CATALOG OF OIL FIELD EQUIPMENT or inquire at the nearest "Oilwell" store.

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The Changing Panorama

Crude Oil Stocks Lowest in 22 Years

AS a result of exceptionally heavy drafts during recent weeks, above-ground stocks of crude oil have dropped to the lowest level in 22 years and now are but half of the all-time peak.

During the four weeks ended July 1, a total of 5,616,000 barrels—a daily average of 200,000 barrels—was taken from crude storage. This is in contrast with the addition of 11,000 barrels daily during the preceding four-week period that ended June 3. The unusually large rate of withdrawal recently is all the more remarkable because it occurred when crude oil producing rates were rising to all-time records each week, averaging 4,565,000 barrels daily, or 52,000 barrels more per day than in the preceding four weeks. This shows the amazing growth that has occurred in oil consumption rates since start of the European invasion.

On July 1 crude oil storage totaled 228,860,000 barrels, 12 million barrels less than at the first of the year, and the lowest since the early months of 1922. This new level of crude oil stocks is but approximately half the all time peak, established when stocks reached 545,557,000 barrels at the end of October, 1929.

At their new level, stocks of crude oil are critically low.

Refinery Bombing Affects Nazi Plans

DURING the first six months of 1944, air forces of the United States have bombed 64 German oil refineries, including several attacks on the Roumanian plants, which are the principal source of natural petroleum products. According to military officers, these attacks have so reduced the enemy's quantity of usable petroleum that it is having an important effect on the mobility of Nazi ground forces.

Most of these attacks on oil installations have been made during the past two months.

It has been suggested that FDR's "acceptance" of the forthcoming Democratic nomination, finally announced last week in Washington, indicates that he has chosen as his theme song: "I'm The Reluctant Drag-in."

"Within the United States our outstanding oil province is the Gulf Coast region, varying up to 300 miles in width, stretching over a length of 1200 miles from Florida to the Rio Grande and already highly productive for more than half its length. Most of our past production has come from this province; and far into the future most of our exploratory activities will be devoted to it and most of our oil will continue to come from it."

OIL IN THE EARTH,
by Wallace E. Pratt

Steel and Spacing Rules Tied Together

THE Production Division of PAW at present is working on plans for further relaxation of well-spacing regulations. Such action would give state agencies more control. However, there are a number of problems that complicate the writing of additional orders, and until PAW completes a thorough study of the situation it is unlikely that new orders will be promulgated.

Among the factors that make the issuing of new orders difficult are these: lack of similarity between spacing patterns and factors of the different states; complete lack of established spacing principles in some states; and lack of uniformity in spacing patterns of fields within the same state.

From the industry viewpoint this lack of any standard spacing pattern might be satisfactory or even desirable. But there is not enough steel for all essential requirements, and PAW is charged with the responsibility of seeing that steel allocated to the industry by WPB is regulated to do the most good, so the materials are not used wastefully, and so individual concerns will share equitably.

There must be some regulation from a national point of view or there would be a scramble between states and companies for steel, which would aggravate the situation wherein demand exceeds supplies. It is feared that should such a situation develop WPB would rescind the authority to allocate oil industry steel that it has given PAW. Therefore, some restrictions or regulations on the use of steel appear necessary.

How best to relax spacing and take into consideration spacing policies of different states and the steel situation is the question before PAW as it considers issuing additional orders.

Invasion Astronomics Of Aviation Gasoline

ACTIVITIES during the first month of the invasion of Europe provide some astronomic statistics with respect to the use of air power and the consumption of aviation gasoline, illustrating as never before the important part that the petroleum industry is playing in war operations because of the miracle it has achieved in manufacturing this 100-octane product.

The allied supreme command has announced that 158,500 sorties, or individual plane flights, were made over Europe during the first month of the invasion, June 6 to July 6. This means that an average of more than 5000 plane flights were made each day from British and French bases.

Information as to how many of these sorties were flown by bombers and fighters is not known, but on the basis of previous activities the flights were probably pretty evenly divided between the two classes. Therefore, if we assume that 75,000 of the flights were by fighter planes, which use approximately 100 gallons of aviation gasoline per hour, this group consumed 7½ million gallons for each aggregate hour flown during the month; and the bombers consumed twice as much gasoline per hour, and probably flew longer distances.

The industry's production of 100 times more aviation gasoline than in 1941 was one of the factors that made it possible to put so many planes into action.

Ally of Oil Industry

ANNOUNCEMENT by Shell Union Oil Corporation of construction of an allyl chloride and allyl alcohol plant at Houston, marks an important step in future commercial developments dependent on oil. The new plant is the result of many years of research and development work on the part of Shell Development Company. Immediate application of the output of the plant will be in the field of plastics for aircraft and war material construction. When peace comes the new process undoubtedly will be turned toward civilian needs, and may be taken as a forerunner of many other advances from which widespread benefits may be expected.

TRAVELING BLOCKS

by GUMBO BUSTER

Gumbo Buster's 534-30 3-Sheave Traveling Block is pictured in close coupled assembly with 50-ton or 100-ton hook. Built especially for short derricks or drilling masts to require less block-hook space. It is used as Standard 534-30 3-sheave block by removing bail, inserting spacer blocks in bail position and inserting roller to accommodate hook becket or bail.

Gumbo Buster's 8-46N Traveling Block is 300 tons capacity. Four or five manganese steel sheaves (rotating on large roller bearings) are 46" diameter. Rope grooves are ground to A.P.I. specifications for 1⅛" or 1¼" wire rope. The built-in wire line guard does not have to be removed to string up block. Lower clevis swings to either side to form support for standing the block upright. It is streamlined, with no projecting surfaces. It is quickly and easily strung up.

See Page 203 of your new Composite Catalog for details of these blocks . . . or write for Bulletin No. 33.

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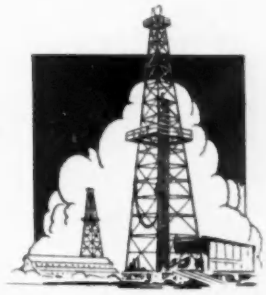

By BERTRAM F. LINZ, Washington Correspondent

THE OPA subsidy program continued last week to be the major oil subject of discussion in Washington, following issuance by the agency of a detailed list of fields where benefit payments would be made at one or another of the three rates for stripper-well production.

Price Fight Continues—There were indications that the subsidy, estimated by OPA to cost the government $55,000,000 a year but set by the industry at a much higher figure, would not halt the campaign for a general price increase, it being pointed out that the program neither offers any aid to the industry in getting wildcat money nor takes care of many situations in fields averaging 9 barrels or more daily production per well.

World Oil Conversations—Interest in the postwar international situation was revived with simultaneous announcement in London and Washington of the personnel of the British mission soon to come to this country to resume negotiation of an international agreement for exploitation of world resources, this time on a cabinet level which will permit the making of official agreements.

Avoid Glut of Oil—Technical meetings last spring laid the foundation for arrangements between the British and American governments, which later will be extended to Holland and other countries having world oil interests, which will provide for the orderly and conservative development of reserves throughout the world and particularly in the Middle East, and some sort of cartel arrangement for a division of markets which will prevent cut-throat competition and a world glut of oil.

Sabotage Warning—Backed by a warning from the War Department that dangerous acts of sabotage were continuing, PIWC Chairman William S. Boyd, Jr., called on the industry to maintain and even strengthen its vigilance against fire and sabotage in order to insure that every drop of oil possible was made available for military use.

Gasoline Ration Checks for Truck Fleet Operators

In a new attack on black-market operations, OPA on July 10 announced cancellation of gasoline inventory coupons and an order permitting truck-fleet operators to use ration checks instead of coupons for gasoline delivered into the tanks of units of their fleets.

The abandonment of the use of inventory coupons, it was said, was due to the discovery of widespread counterfeiting, large numbers of both counterfeit and stolen coupons recently turning up in increasing proportions in ration-bank deposits in many parts of the country.

By authorizing fleet operators to meet gasoline ration obligations by check instead of coupons, OPA hopes to eliminate the handling of coupons by drivers and their possible diversion into unauthorized channels.

British Companies Make Plans for Postwar Trade

The Council of British Manufacturers of Petroleum Equipment, with headquarters in London, has been formed to assure utmost cooperation among manufacturers and users during the postwar marketing period.

Sponsored by the Institute of Petroleum, the objective of the new organization is "to do everything possible to put the British petroleum equipment industry into proper shape, and to reduce to a minimum the buying of American-made equipment by British users, and to secure the benevolent assistance of all British oil companies".

Better Industry Representation Likely In Renewed Anglo-American Oil Talks

Final working out of Anglo-American plans for postwar development of world oil resources will be attempted shortly in meetings between high officials of the two governments, it was announced jointly in Washington and London July 12.

The announcement disclosed that the British delegation, to be headed by Lord Beaverbrook, will include Richard Law, minister of state; Geoffrey Lloyd, chairman of the oil control board, and Ralph Assheton, financial secretary to the treasury, with Sir William Brown, who headed the technical group which came to Washington last April, as chief technical adviser to the delegation.

The corresponding American delegation will be headed by Secretary of State Cordell Hull, and include Secretary of the Interior Harold L. Ickes, vice chairman; Secretary of the Navy James V. Forrestal; Under-Secretary of War Robert P. Patterson; Foreign Economic Administrator Leo T. Crowley; Deputy Petroleum Administrator Ralph K. Davies; War Production Board Vice Chairman Charles E. Wilson, and Charles Rayner, petroleum adviser to the State Department.

The discussions, on a cabinet level which will permit the writing of formal agreements, will be based on the results of the meetings held two months ago between the British and American groups which explored the postwar oil situation and agreed upon principles for orderly marketing and economic development of world resources.

The exploratory discussions went into problems affecting the operations abroad of the American and British oil industries; questions relating to oil production, particularly in the middle east where they involved the proposed Trans-Arabian pipe line and the Iraq Petroleum Company's project for an additional pipe line from Kirkuk, Iraq, to Haifa.

Long Range Development

The principles laid down in the report of the two technical groups called for the orderly long-range development of abundant oil supplies, and free access thereto by all nations.

It is expected that the American committee will be assisted in its deliberations by a committee of advisers, on which the oil industry will be represented. The formation of such a committee was suggested by the American expert group, but its members would have a more official standing than did the oil men who participated in the preliminary conferences, being appointed by the government and charged with the responsibility of studying problems that should be considered in arriving at final conclusions.

McWilliams Is Named to Take Over Knowlton's Production Division Job

Appointment of J. R. McWilliams as director of the production division to succeed Donald R. Knowlton, who resigned in May to return to Phillips Petroleum Company, was announced last week by PAW.

McWilliams, who will come to Washington on leave from The Carter Oil Company, of which he is vice president and manager of the Northwest Division, with headquarters at Billings, Montana, was born in Barton County, Missouri, in December 1895, and after completing his education at the University of Michigan, where he received a degree in civil engineering, entered the oil industry in 1919. He worked first in engineering capacities in various fields and in 1925 became production engineer in the Mid-Continent area for Skelly Oil Company, leaving in 1933 to serve for six months as assistant proration umpire for the Oklahoma Corporation Commission. He joined The Carter Oil Company in 1934 as proration engineer, and was transferred to Standard Oil Company of Louisiana in 1936 as vice president in charge of production, returning again to The Carter Oil Company in May 1941, as production manager, becoming vice president in April 1944.

J. R. McWILLIAMS

"At the present time crude oil must be produced in greater quantities than ever before in order to keep pace with record-breaking refining operations and unprecedented military demands," Deputy Administrator Davies said in announcing the appointment. "This appointment fills a critically important vacancy in our organization. I am greatly pleased that McWilliams has so agreed to devote himself to the war service of the nation. His ability and broad experience will be most effectively utilized in the nation-wide direction of production activities."

Boyd Repeats His Warning Against Fire and Sabotage

Continued vigilance against fire and sabotage was urged on all oil companies July 10 by William R. Boyd, Jr., chairman of the Petroleum Industry War Council.

Boyd's plea was supported by a letter from Undersecretary of War Robert P. Patterson, warning that continuance of dangerous acts of sabotage and the tremendous toll of industrial resources and output taken by fires and accidents refute any assumption that security measures now are less important than in the past.

Recalling that PIWC is one of the only two recipients of the United States Coast Guard Security Shield of Honor in recognition of its contribution to the safety and protection of vital war facilities, Boyd declared "the favorable fire record reported in 1943 by both the PAW and American Petroleum Institute may not be duplicated in 1944 unless adequate fire protection measures are maintained.

"Increased use of sour crude oil, particularly at refineries lacking corrosion-resistant equipment and corrosion-protection experience, could result in fires unless prompt steps are taken to compensate for these unfavorable conditions," he said.

Shortages of experienced personnel and lack of time for the complete training of new workers also may tend to increase accidents and fires, he pointed out.

"Unless every known precaution is taken, new and modified refinery processes may suffer some accidents and fires until experience is gained in the efficient operation of equipment geared to wartime standards," he explained. "Severity of fires might likely increase with the decrease in workers' knowledge and experience in fire control and fire extinguishment."

In his letter, addressed to George A. Hill, Jr., chairman of the PIWC Committee on Protection of Petroleum Facilities, Patterson stressed that the military services are depending upon the industry for continued production and delivery.

"Recently the War and Navy Departments announced a revised internal security policy designed to curtail expenditures and to utilize efficiently available manpower commensurate with the present offensive phase of the war," he said.

"The unique importance of the petroleum industry in the prosecution of the war increases the necessity for management to exercise its primary responsibility for the protection of its facilities. I am informed that the revised internal security policy has been misinterpreted by some persons to indicate decreased probability of interference with production by fire, accident and sabotage, and, therefore, a waning interest by the War Department in security measures adopted and vigorously pursued by the petroleum industry. Both assumptions are decidedly unwarranted. The continuance of dangerous acts of sabotage and the tremendous toll of our industrial resources and output taken by fires and accidents refute them.

"The critical shortage of petroleum products demands all available facilities to meet our wartime requirements. We cannot relax our protection efforts lest production and delivery be impaired."

Sale of Jacksonville Oil Terminal in DPC Hands

All surplus real estate of non-industrial nature held by the War and Navy departments will be disposed of through the Reconstruction Finance Corporation, under an agreement reached by William L. Clayton, surplus war property administrator, and the two departments.

Disposition of the Moore airfield, the 532-acre patch at Normand, Oklahoma, where surrounding oil developments made the field too dangerous for aviation before it ever was completed, is under determination in the Navy Department, but no decision has been reached as to whether it is to be turned over to RFC for sale. Legislation to permit the resale of the property to the original owners for the price paid by the government plus the amount expended on improvements failed in the House of Representatives last month as Congress prepared to recess.

While the procedure to be followed in handling the property has not been decided, it was indicated that if the Navy can find no use for the land it will be turned over to RFC.

Defense Plant Corporation, an RFC subsidiary, was disclosed last week to have a number of industrial properties for sale, including a complete oil terminal of 196 acres at Jacksonville, Florida, formerly operated by the General American Transportation Company. This property, capable of expansion and holding rights-of-way, was erected for crude oil, but DPC said probably could be adapted for other uses. Actual cost of the land was $100,000 and $1,650,000 was expended on facilities, which include two 55,000 gallon and two 80,000 gallon tanks, with complete pumping equipment; two docks approximately 700 feet long to a 14-foot depth of water which can be extended approximately 600 feet to the deep-water channel in St. Johns River; a main-line spur railroad with yard tracks, repair tracks and unloading racks; oil storage facilities and a distributing system and accessible roads, electric system, telephone and telegraph lines and water supply. Buildings on the property consist of a boiler house, pump house, warehouse, administration building, water tank, dispatchers house, and tool shed. The sale of the property is sponsored by the Office of Defense Transportation.

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W. H. LYNE, 71, one of the pioneers in the Gulf Coast oil industry, died July 8, in Dallas. He entered the oil business in 1903 when he became associated with W. B. Sharpe in his activities around Beaumont, and became general manager of Sharpe's Producers Oil Company until it was absorbed by The Texas Company in 1916, at which time he was made district superintendent of production for the South Texas division of The Texas Company. He held this position until forced to retire because of ill health in 1925.

Company Asks Court to Order Return Of Patents Seized as Enemy Property

Charging that the alien property custodian had confiscated valuable property belonging to American citizens, Standard Oil Company (New Jersey), officials in Washington announced July 13 that the company had filed suit in a New York federal court for a preliminary injunction against the disposition of patents seized by APC last May 24 as the property of enemy nationals.

At the same time, the company asked that the court order the custodian to return the seized properties, which it claimed it purchased from I. G. Farbenindustrie 15 years ago for $35,000,000. The principal patents involved relate to 100-octane gasoline, buna rubber and toluol.

"The custodian has sought to create the impression that he is seizing enemy property and passing it on free to Americans for their use," it was declared by Eugene Holman, president of the company. "Actually, he has confiscated valuable property belonging to American citizens, property in which many American companies have invested huge sums in patent licenses and development work.

Charges Arbitrary Action

"Under our laws, all patents are available for war production. But the custodian, presumably acting under the advice of the Attorney General's office, has arbitrarily adopted a policy of granting free licenses under these patents, not limited to the war, but for the full life of the patent, without waiting for court decision on ownership of the patent properties themselves. Instead of holding and conserving such property as custodian, he is dissipating the property and destroying the stimulus to develop it."

Holman asserted this practice "is completely without precedent and without Congressional authority" and disregards accepted principles of law and property rights.

"The custodian's excuse for his present policy has been that it would greatly help the war effort," he said. "There have been dramatic developments, vital to the national of industry, based upon patents originating in Germany. But without exception every one was sponsored by American concerns who acquired rights under those patents before the war began. They invested their capital and used their knowledge to develop these enemy-originated ideas to the point where they are now vital factors in the American war program. These were results from efforts of American industry protected and stimulated by United States patent laws. They were not the results of the mistaken policy of the custodian."

Standard's charges that the government had confiscated American property were denied July 14, by Alien Property Custodian James E. Markham.

"My office has given consideration to the claims of the Standard Oil Company that it was the owner of certain patents and shares of stock involved in arrangements with I. G. Farbenindustries," he declared. "After examining the facts and discussing the case with representatives of Standard we concluded that I. G. Farbenindustries owned both the patents and securities at the time of their seizure."

Markham asserted that the company recognized that the problem of ownership could not be resolved by the simple assertion that patents were bought from the German trust 15 years ago for $25,000,000 and added, "I am fully satisfied to have the question of ownership settled by the courts.

"It has been the consistent policy of this office to respect and reserve legitimate American rights in enemy patents," he said.

New Regulation Placed On Public Land Leasing

Regulations of the general land office relating to applications for oil and gas leases on the public lands have been amended to provide that applicants for leases without competitive bidding must pay the filing fee and at least one half of the first year's rental on the approximate area of land described in the application at the time application is filed.

Such applications must be accomplished by a statement that payment of the filing fee and one half of the first year's rental is submitted and that the applicant is ready, upon demand, to pay the remainder of the rental and to furnish such bond or bonds as may be required under the lease or regulations.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED July 15	July 8
Alabama	150	100
Arkansas	80,500	80,400
California	852,300	853,400
Colorado	8,500	8,350
Illinois	198,200	207,600
Indiana	13,950	12,600
Kansas	278,800	266,250
Kentucky	21,800	20,900
Louisiana	360,000	363,200
North Louisiana	73,000	74,200
South Louisiana	287,000	289,000
Michigan	51,000	49,000
Mississippi	44,050	44,150
Missouri	100	100
Montana	20,730	26,350
Nebraska	1,000	900
New Mexico	108,300	108,300
New York	12,500	13,600
Ohio	5,400	7,300
Oklahoma	341,250	337,900
Pennsylvania	37,300	38,300
Tennessee	35	35
Texas	2,063,550	2,037,500
Upper Gulf Coast	531,400	528,900
East Texas Field	363,200	360,900
Rest of Eastern Texas	148,000	145,000
Lower Gulf Coast	216,800	215,800
Southwest Texas	78,600	77,500
South Central Texas	21,000	19,800
West Texas	462,050	448,050
North Texas	151,500	149,500
Panhandle	91,000	92,000
West Virginia	7,900	8,200
Wyoming	80,700	91,300
Total United States	*4,588,015	4,575,735

*New all-time peak.

House-Brand Gasoline Lead Content Again Cut

PAW took the "anti" out of anti-knock gasoline July 14 with orders to refiners immediately to drop the quality of house brand gasoline from 72 to 70 octane in order to release additional tetraethyl lead for 100-octane fuel.

The more than 500,000 barrels of 100-octane gasoline produced daily by United Nations refineries is not enough to meet the demands of the air forces around the world and replenish inventories abroad depleted by the tremendous operations incident to the invasion of Europe, it was disclosed.

To obtain every possible barrel of military gasoline, PAW on June 22 ordered a cut-back in the production of premium gasoline amounting to 60 percent. That order, it is estimated, will yield an additional 1,500,000 pounds monthly of tetraethyl lead. The reduction of octane count in regular gasoline will provide an additional 25,000,000 pounds a month. The production of 100-octane gasoline is made possible by the "loading in" of 4.6 cubic centimeters of tetraethyl per gallon.

The first two weeks of the invasion of France seriously depleted combat theatre stocks in England, and brought from military leaders a demand for the stepping up of aviation gasoline production as one step toward providing replacement fuel, the rubber director on June 26 released 400,000 barrels of butylenes for use by gasoline manufacturers.

Heretofore 30 percent of the tetraethyl fluid used in gasoline has been made available for civilian fuel. The cut in octane rating will reduce that ratio to 23 percent. It was indicated that 72-octane production would not be resumed until the successful culmination of the European campaign was assured.

Mississippi and New York Hearings Delayed by FPC

The Federal Power Commission has postponed until August 9, the hearing originally scheduled July 18 to determine the reasonableness of Mississippi River Fuel Corporation rates in connection with the transportation or sale of natural gas.

It also postponed from July 14 to August 14 the hearing on the application of the New York State Natural Gas Corporation for authority to purchase from the Peoples Natural Gas Company an 89-mile pipe line in Pennsylvania and a paralleling private telephone line at a cost of $815,256.

Polish Engineers Organize For Postwar Oil Activity

Native Polish petroleum engineers now serving in the Allied armed forces or otherwise domiciled in the British Isles, have formed an organization for conducting research and studying British methods of oil field and refining operations, in order to rebuild and modernize the Polish industry following the end of the war.

Two meetings of the group have been held this year, at Glasgow and Birmingham, and steps are being taken to bring all eligible engineers together at a central locality for intensive study under the supervision of British experts.

United States Stripper-Well Pools Listed for Subsidy Payments

All states with production included in tabulation except Alabama, California, Florida, Mississippi, Virginia and Utah. All payments will be made through first purchaser

Making public a tabulation of the fields and pools where the new subsidy payments for stripper-well and hardship production will apply, OPA on July 11 disclosed that no payments will be authorized at this time for producers in Alabama, California, Florida, Mississippi, Utah and Virginia because of the lack of adequate data for a determintion whether they qualify for assistance.

Under the order announced by Stabilization Director Fred M. Vinson July 6 (THE OIL WEEKLY, July 10), Defense Supplies Corporation will pay a subsidy through the first purchasers of crude ranging from 35 cents a barrel for pools averaging less than 5 barrels daily per well to 20 cents a barrel for pools averaging 7 or more but less than 9 barrels daily. A special figure of 75 cents per barrel is provided for all Pennsylvania grade crude wells, which average about ½ barrel per day.

The pools where the payments of 20 to 35 cents a barrel over existing ceilings are allowed, effective August 1, were designated by OPA by specific name or group. They are located in Arkansas, Colorado, Illinois, Indiana, Kansas, Kentucky, Louisiana, Michigan, Missouri, Montana, Nebraska, New Mexico, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas and Wyoming.

Basis for Subsidy

Determination of eligibility of pools for the subsidy will be determined on the basis of the daily average per well production during December, 1943, or on average production over a period of one year preceding the application for a premium payment, the latter taking care of pools not qualifying in the December, 1943 period, but later coming within the stripper category.

OPA also has been authorized to allow premium payments not exceeding 35 cents per barrel in certain hardship cases where the daily average per-well production of a pool is 9 barrels or more where, because of certain high-cost factors, the maximum price for the production is below the average cost of producing and the latter is not out of proportion to the output obtainable.

As an example of how the hardship provision will apply, OPA announced that the maximum price for the Smackover field in Arkansas, which was increased by 15 cents a barrel last January, to 98 cents per barrel, because of hardship, has been reduced to the original figure of 83 cents per barrel and a premium payment of 20 cents a barrel authorized, increasing the return to operators to $1.03 per barrel.

PRICE FIGHT GOES ON

IMMEDIATELY upon announcement of the plan, representatives of the Independent Petroleum Association urged officials of Defense Supplies Corporation and OPA to make the subsidy retroactive to July 1, on the ground that some producers who will receive benefit payments might retain their production on the lease until August 1.

There was no information available indicating that this was being done but OPA officials pointed out that it had been a common practice for producers to hold back their oil when it was known that a price increase was about to take effect.

The question of price is one of the subjects to be discussed at Fort Worth July 25 when members of the IPPA executive committee meet for the first time in a considerable period.

Announcement of the subsidy has not stilled the agitation for a general price increase, it was said, the OPA plan failing to meet two situations; that of the high-cost producers in field averaging more than 9 barrels a day, where several times as much water is produced as oil, and the need for a greater margin to provide risk money for wildcatting.

While the hardship provision of the plan supposed to take care of the first situation, it was pointed out that whether it is workable in any given field or not will depend upon the interpretation of the requirement that cost of production not be out of proportion to the output obtainable.

In addition to price, the Fort Worth meeting will discuss manpower and materials problems and the international situation and postwar possibilities. Plans also will be laid for the annual meeting of the association to be held this fall.

All of the subsidies initially granted are subject to correction in the event inaccuracies in listings are found, it was stated, and the way is also left clear for the granting of increases, but not exceeding the maximum limit of 35 cents, where production is found to have declined after lower payments were certified. The cost of the program to the government, including payments which will be authorized in the six states temporarily excluded, is now estimated at approximately $55,000,000 a year.

More than half of the increases granted called for the maximum of 35 cents per barrel and only about 15 percent called for the minimum of 20 cents, but OPA figures did not show the production in barrels in those categories. All told, however, it was estimated that owners of 280,000 wells with a daily production of 404,000 barrels will benefit from the subsidy.

OPA on July 13 added 13 pools to the eligible list, as follows: (State, pool, county, and premium payment in each case):

Indiana—Wheeling (Gibson) 35 cents.

Kansas—Halstead (Harvey) 20.

Michigan—Otisville (Genesee) 20.

Oklahoma—Deer Creek (Grant) 25; Knox (Grady) 25; Little River (East Seminole) 20; and Oscar (Jefferson) 25.

Texas—Admi (Webb) 35; Agna, Prieta (Duval) 35; Angleton (Brazoria) 35; Aviators (Webb) 35; Lost Lake (Chambers) 35; Marion, shallow (Marion) 35.

The OPA order, specifying the payments to be made in the various pools and fields, was as follows (pool, county or parish and cents per barrel increase).

ARKANSAS

El Dorado, East (Union) 25. El Dorado, South (Union) 35. Lewisville (Lafayette) 20. Lisbon (Union) 35. Nick Springs, Cotton Valley (Union) 35. Smackover (Ouachita, Union) 20. Stephens (Columbia, Nevada, Ouachita) 35.

COLORADO

Berthoud (Larimar) 20. Boulder (Boulder) 35. Florence (Fremont) 35. Orchard-Greasewood (Weld) 25.

ILLINOIS

Aden (Wayne and Hamilton) 25. Albion-North (Edwards) 35. Barnbill (Wayne) 35. Bartelso (Clinton) 25. Bartelso-South (Clinton) 25. Beaver Creek (Bond) 20. Beman (Lawrence) 35. Browns-South (Edwards) 35. Burnt Prairie (White) 20. Carlyle (Clinton) 35. Centralia (Clinton, Marion) 25. Cisne (Wayne) 25. Colmar-Plymouth (McDonough-Hancock) 35. Cordes (Washington) 25. Cowling (Edwards) 35. Cravat (Jefferson) 25. Dahlgren (Hamilton) 35. Du Bois (Washington) 35. Du Bois-West (Washington) 25. Dundas Consolidated (Richland and Jasper) 35. Dupo (St. Clair) 35. Eldorado (Saline) 35. Elkville (Jackson) 25. Gillespie Wyen (Macoupin) 35. Hoffman (Clinton) 35. Ingraham (Clay) 35. Inman (Gallatin) 25. Johnsonville-South (Wayne) 35. Junction (Gallatin) 35. Keensburg Consolidated (Wabash) 20. Lakewood (Shelby) 20. Lancaster (Wabash and Lawrence) 25. Leech (Wayne) 20. Litchfield (Montgomery 35. Mason Effingham 35. Maunie-North (White) 35. Mt. Carmel-West (Wabash) 25. Mt. Erie-North (Wayne) 25. Patoka (Marion) 20. St. Francisville E. (Lawrence) 20. Sainte Marie (Jasper) 20. Sesser (Franklin) 25. Southeastern Field (Lawrence, Clark, Crawford and Wabash) 35. Stewardson (Shelby) 20. Storms (White) 20. Thompsonville (Franklin) 35. Toliver (Clay) 35. Wamac (Marion, Clinton and Washington) 35. Waterloo (Monroe) 35. Whittington-West (Franklin) 25. Woburn (Bond) 35. Xenia (Clay) 25.

INDIANA

Bristow-old (Perry) 35. Bufkin (Posey) 20. Cannelburg-old (Daviess) 35. Carbon West (Posey) 35. Columbia (Gibson) 35. Enterprise (Spencer) 35. Evansville Area-old (Posey and Vanderburgh) 35. Francisco, E. & W. (Gibson) 35. Grandview (Spencer) 35. Hatfield

(Spencer) 20. Hazelton-old (Gibson) 35. Hensler (Posey) 20. Hovery Lake (Posey) 20. Johnson (Gibson) 35. Kirksville (Gibson) 20. Mt. Carmel (Gibson) 20. Petersburg-old (Pike) 35. Rockport (Spencer) 25. St. Francisville (Knox) 35. St. Francisville E. (Knox) 20. St. Thomas (Knox) 35. Shelburn-old (Sullivan) 35. Siosi (Sullivan and Vigo) 20. Somerville (Gibson and Pike) 35. Troy-old (Spencer) 35. Veale-old (Daviess) 35. Washington-old (Daviess) 35.

KANSAS

Abbyville (Reno) 25. All pools (Allen) 35. All pools (Anderson) 35. All pools (Chautauqua) 35. Al pools (Franklin) 35. All pools (Linn) 35. All pools (Miami) 35. All pools (Neosho) 35. All pools (Wilson) 35. All pools (Woodson) 35. Augusta (Butler) 35. Augusta North (Butler) 35. Baird (Cowley) 20. Baird East (Cowley) 20. Bausinger (Butler) 35. Benton (Butler) 25. Bidde (Cowley) 35. Blackwell (Greenwood) 35. Blankenship (Butler) 35. Bridfeldt, West (Rice) 20. Bringer (Greenwood) 35. Browning (Greenwood) 35. Burden (Cowling) 35. Bush-Denton (Elk) 35. Callyer (Elk) 25. Chandler (McPherson) 25. Christy (Greenwood) 35. Churchill (Sumner) 25. Clark (Cowley) 20. Clever (Cowley) 25. Countrymen (Cowley) 35. Covert-Sellers (Marion) 25. Craber (McPherson) 20. David (Cowley) 20. David, South (Cowley) 35. Demaloris-Snowden (Greenwood) 25. Dory (Elk) 35. Douglas (Butler) 35. Dunaway (Greenwood) 35. Dunkelberger (Elk) 35. Eastborough (Sedgwick) 20. Eastman (Cowley) 35. Eckels (Butler) 20. Eichman (Russel) 35. El Dorado (Butler) 35. Eureka (Greenwood) 35. Fairfield (Russel) 25. Fall City (Cowley) 35. Ferguson, East (Elk) 20. Ferguson, West (Cowley) 35. Florence (Marion) 35. Fox Bush (Butler) 35. Garden (Butler) 35. Gelwick (Butler) 20. Gettysburg (Graham) 25. Graber (McPherson) 20. Graham (Cowley) 20. Grand Summit (Cowley) 35. Gueda Springs (Cowley) 25. Haller (Ellis) 25. Halstead (Harvey) 20. Hamilton (Greenwood) 35. Haverhill (Butler) 25. Haiken (Ellsworth) 35. Hinchman (Greenwood) 35. Hollis (Greenwood) 35. Hower (Cowley) 25. Jackson (Greenwood) 35. Keighlez (Butler) 35. Keller (Greenwood) 35. Kramer-Stein (Butler) 35. Kriley (Rocks) 25. Kurich (Rocks) 20. Lamont (Greenwood) 35. Leon (Butler) 35. Lerado (Reno) 35. Lost Springs, West (Marion) 25. Lyon (Harvey) 35. Lyons (Rice) 35. Madison (Greenwood) 35. Mahoney (Russell) 35. Malins (Elk) 35. McCullough (Butler) 25. McPherson (McPherson) 25. Mills (Elk) 35. MoHannah (Cowley) 35. Morrison (Clark) 35. Murphy (Cowley) 25. Nohl (Russel) 20. Olson (Cowley) 35. Otter Creek (Cowley) 35. Padgett (Sumner) 20. Peabody (Marion) 25. Penokee (Graham) 20. Pierce (Butler) 35. Pippes (Greenwood) 35. Polhamus (Greenwood) 35. Porter (Elk) 35. Potwin (Butler) 25. Potwin, South (Butler) 20. Rainbow Bend (Cowley) 25. Reese (Greenwood) 35. Reiken (Ellsworth) 35. Reynolds-Schaffer (Butler) 20. Robbins (Sedgwick) 35. Rock (Cowley) 35. Rock, North (Cowley) 35. Ruder (Ellis) 20. Sallyards (Greenwood) 35. Scott (Greenwood) 35. Seeley-Wick (Greenwood) 35. Severy (Elk) 35. Seward (Butler) 35. Slick-Carson (Cowley) 25. Smith (Cowley) 35. Smock-Deiss (Butler) 35. State (Cowley) 35. Steinhoff (Butler) 25. Teeter (Greenwood) 35. Teichgraber (Greenwood) 35. Thrall-Agard (Greenwood) 35. Thurlow (Cowley) 35. Triss (Cowley) 25. Tuney (Greenwood) 35. Turner (Cowley) 25. Udall (Cowley) 25. Van Roy (Coffey) 35. Virgil (Greenwood) 35. Virgil, North (Greenwood) 35. Walker (Elk) 35. Weathered (Cowley) 20. Weaver (Butler) 35. Webb (Elk) 35. Welch, North (Rice) 25. Wellington (Sumner) 25. Wherry (Rice) 20. Wiggins (Greenwood) 35. Wilkerson (Greenwood) 35. Willard (Greenwood) 35. Winfield (Cowley) 35. Yoder (Reno) 35. Young (Butler) 25.

KENTUCKY

Cairo (Henderson) 20. Coryden (Henderson) 20. Greenbriar (Henderson) 25. Helbardsville (Henderson) 25. Sebree (Webster) 25. Spring Grove (Union) 20. Zion (Henderson) 25.

All other pools in the State of Kentucky except Gilmore, Poole, Reed, Robards, Smith Mills and Spottsville Pools, Henderson County; Livermore Pool, McLean County; Hitesville, Morganfield, St. Vincent, Uniontown, Utley and Wathen Pools, Union County; East Poole and Pratt Pools, Webster County, 35.

LOUISIANA

Bayou Bouillon (St. Martin) 35. Bellevue (Bossier) 35. Belle Isle (St. Mary) 25. Bisteneau (Bienville-Bossier) 35. Branch (Acadia) 35. Caddo (Caddo) 25. Carterville (Bossier-Webster) 35. Converse (Sabine) 25. Delta Duck Club (Plaguemines) 35. Driscoll (Bienville) 35. Edgerly (Calcasieu) 20. Elm Grove (Bossier-Caddo) 20. Homer (Claiborne) 20. Lake End (Red River) 35. Lake Hermitage (Plaguemines) 35. Logansport-Joaquin (De Soto) 20. Manifest (Catahoula) 25. Oakland (Union) 35. Perkins (Cameron) 35. Pleasant Hill (De Soto-Sabine) 35. Sibley (Webster) 25. Simsboro (Lincoln) 20. Welsh (Jefferson Davis) 35.

MICHIGAN

Beaverton (Gladwin) 35. Bentley (Gladwin) 25. Birch Run (Saginaw) 35. Bloomingdale (Van Buren) 35. Casco (Allegan) 35. Clare City (Clare) 35. Columbia (Van Buren) 35. Crystal (Montcalm) 25. Dalton (Muskegon) 35. Deerfield (Monroe) 25. Diamond Springs (Allegan) 35. Dorr (Allegan) 35. Edenville (Midland) 35. Edmore (Montcalm) 35. Freeman (Clare) 20. Grout (Gladwin) 35. Hope (Barry) 25. Hopkins (Allegan) 35. Lakefield (Saginaw) 35. Leaton (Isabella) 25. Montegey (Allegan) 35. Mt. Pleasant & East Ext. (Isabella) 35. Muskegon (Muskegon) 35. Muskrat Lake (Van Buren) 35. New Salem (Allegan) 35. Oberisel (Allegan) 35. Pine River (Gladwin) 25. Porter (Midland) 20. Saginaw (Saginaw) 35. Salem (Allegan) 35. Sauble (Lake) 20. Sherman (Isabella) 35. South Akron (Tuscola) 35. South Buckeye (Gladwin) 35. South Tallmadge (Ottawa) 35. Trowbridge (Allegan) 35. Vernon (Isabella) 25. Walker (Kent) 35. West Branch (Ogemaw) 35. West Hopkins (Allegan) 35. Winfield (Montcalm) 35. Wise (Isabella) 20. Wyoming Park (Kent) 35. Yost-Jasper (Midland) 20.

MISSOURI

All pools in Missouri except Tarkio Pool, Atchison County, 35.

MONTANA

Border (Toole) 35. Cat Creek (Petroleum) 35. Kevin Sunburst (Toole) 35. Pondera (Teton) 35. Reagon Nose (Glacier) 25. Sweet Grass Hills Area (Toole) 35.

NEBRASKA

Barada (Richardson) 20.

NEW MEXICO

Anderson (Eddy) 20. Artesia (Eddy) 35. Aztec (San Juan) 35. Dayton (Eddy) 20. High Lonesome (Eddy) 35. Rattlesnake (San Juan) 35. Red Lakes (Eddy) 25. Turkey Track (Eddy) 25.

NEW YORK

All Pools producing Pennsylvania grade crude in New York, 75.

OHIO

All Pools producing Pennsylvania grade crude in Ohio, 75.

All other pools in Ohio, 35.

OKLAHOMA

Ada, East (Pontotoc) 35. Alabama (Hughes) 35. All pools (Craig) 35. All pools (Nowata) 35. All pools (Rogers) 35. All pools (Washington) 35. Allen, shallow (Pontotoc) 35. Almeda (Osage) 35. Alsuma (Tulsa) 35. Altus (Jackson) 35. Arno (Creek) 20. Asher, West (Pottawatomie) 20. Avant (Osage) 35. Avant, West (Osage) 35. Avery (Lincoln) 35. Aztec (Okmulgee) 35. Backius (Osage) 35. Bald Hill (Okmulgee) 35. Baltimore, North (Okfuskee) 35. Bandwheel (Osage) 35. Barker (Osage) 25. Barnes (Garfield) 35. Barnsdall (Osage) 35. Barnsdall, South (Osage) 35. Barnsdall, West (Osage) 35. Bartlesville (Osage) 35. Bebee, East (Pontotoc) 35. Beggs, North (Okmulgee) 35. Beggs, South (Okmulgee) 35. Beidleman (Okfuskee) 35. Bethel (Seminole) 35. Bethel, Northeast (Seminole) 35. Big Horse (Osage) 35. Bilby (Wagoner) 35. Bird Creek (Tulsa) 35. Birch Creek (Osage) 35. Bixby (Tulsa) 35. Blackwell (Kay) 20. Boston (Osage) 20. Boston, North (Osage) 35. Bowring (Osage) 35. Boyle (Muskogee) 35. Boynton (Muskogee) 35. Braman (Kay) 25. Branstetter (Osage) 35. Brinton (Okmulgee) 35. Bristow (Creek) 25. Bristow, North (Creek) 35. Bristow, West (Creek) 35. Britton (Oklahoma) 20. Brock (Carter) 35. Broken Arrow (Tulsa) 35. Brown (Garfield) 35. Broyles (Payne) 25. Bruce (Creek) 35. Bruce, East (Creek) 35. Bruner-Vern (Tulsa) 35. Buell (Osage) 35. Bulldog (Osage) 35. Burbank, Osage (Osage) 35. Burbank, Kay (Osage) 20. Butler (Muskogee) 35. Candy Creek (Osage) 35. Carey (Okfuskee) 25. Castle, South (Okfuskee) 35. Clarita (Coal) 35. Clearview (Okfuskee) 35. Cleveland (Pawnee) 35. Coalton (Okmulgee) 35. Cole (Muskogee) 35. Collinsville (Tulsa) 35. Comanche (Stephens) 35. Conservation (Pontotoc) 35. Corine (Wagoner) 35. Council (Muskogee) 35. Country Club (Osage) 35. Coweta (Wagoner) 35. Cruce (Stephens) 35. Cushing (Creek) 35. Dalton, (Osage) 35. Davenport (Lincoln) 35. Davenport, North (Lincoln) 35. Dawson (Tulsa) 35. Deaner (Okfuskee) 35. Deep Fork (Creek) 35. Dewey (Osage) 35. Dilworth (Kay) 20. Domes (Osage) 35. Donnelly (Creek) 20. Dora (Seminole) 25. Duncan, North (Stephens) 35. Duncan, West (Stephens) 35. Ed Cox (Carter) 35. Edgewood (Osage) 35. Edna (Creek) 20. Edna, East (Okmulgee) 35. Elgin, South (Osage) 35. Empire (Stephens) 25. Enfisco (Osage) 35. Enos (Marshall) 35. Eram (Okmulgee) 35. Fairfax (Osage) 35. Falls Dome (Osage) 35. Fields (Okfuskee) 35. Fisher (Tulsa) 35. Fitts, North (Pontotoc) 35. Fitts, South (Pontotoc) 25. Flat Rock (Osage) 35. Flesher (Osage) 35. Foraker (Osage) 20. Forty-Five (Osage) 35. Fox (Carter) 20. Francis, West (Pontotoc) 35. Frederick (Tillman) 35. Garber (Garfield) 35. Garber, North (Garfield) 20. George (Wagoner) 35. Gessman, (Lincoln) 20. Gillette (Wagoner) 35. Gilliland (Osage) 35. Glenn Pool (Creek) 35. Goble (Wagoner) 35. Graham (Carter) 35. Gregory (Okfuskee) 35. Gypsy Hill (Okfuskee) 35. Gypsy Hill, Northwest (Okmulgee) 35. Hallett (Pawnee) 35. Hamilton Switch (Okmulgee) 35. Hanbury (Comanche) 35. Happy Hollow (Osage) 35. Haskell (Muskogee) 35. Hector (Ogmulgee) 35. Henryetta (Okmulgee) 35. Healdton (Carter) 35. Hewitt (Carter) 25. Hickory Creek (Osage) 35. Hickory Creek, South (Osage) 35. Hickory Grove (Creek) 25. Hobart (Kiowa) 25. Hoffman (McIntosh) 35. Holdenville, West (Hughes) 35. Hominy (Osage) 35. Hominy, East (Osage) 35. Hominy Falls (Osage) 35. Hominy, South (Osage) 35. Independent (Creek) 35. Ingalls, Northeast (Payne) 25. Iron Post (Creek) 35. Isom Springs (Marshall) 35. Jenks (Tulsa) 35. Jennings (Pawnee) 35. Josey (Okfuskee) 20. Kasishke (Osage) 35. Kaw (Osage) 20. Kellyville (Creek) 35. Keystone (Pawnee) 35. Kingston (Marshall) 35; Konawa (Seminole) 20 Konawa, East (Seminole) 25. Konawa, South (Seminole) 25. Langston, South (Logan) 20. Lauderdale (Pawnee) 35. Lawton (Comanche) 35. Lee Dome (Osage) 35. Leonard (Tulsa) 35. Lincreek (Lincoln) 35. Link (Muskogee) 35. Loco (Stephens) 35. Lovell (Logan) 20. Lyons-Quinn, (Okfuskee) 25. Madalene (Osage) 35. Madalene, East (Osage) 35. Madill (Marshall) 35. Manion (Osage) 35. Manion, North (Osage) 35. Mannford (Creek) 35. Maramec (Pawnee) 25. Markham (Payne) 35. Marshall (Logan) 20. Masham (Pawnee) 35. Maud (Pottawatomie) 20. Mehan (Payne) 35. Mercer (Creek) 25. Meridian (Logan) 20. Milroy (Stephens) 35. Montezuma (Okmulgee) 35. Morgan (Okfuskee) 25. Morris (Okmulgee) 35. Mounds (Creek) 35. Muskogee (Muskogee) 35. Natura (Okmulgee) 35. Nuyaka, South (Okmulgee) 35. Nuyaka, Southwest (Okmulgee) 35. New England (Osage) 35. Nicoma Park (Oklahoma) 20. Norfolk (Payne) 35. Norfolk, West (Payne) 20. Oakman (Pontotoc) 35. Ochelata, North (Osage) 35. Okemah (Okfuskee) 35. Okemah, West (Okfuskee) 35. Okesa (Osage) 35. Okfuskee (Okfuskee) 35. Oklahoma Central (Okmulgee) 35. Okmulgee (Okmulgee) 35. Olean (Creek) 35. Olive (Creek) 35. Olympic (Okfuskee) 35. Oneta (Wagoner) 35. Osage City (Osage) 35. Osage City, East (Osage) 35. Osage-Hominy (Osage) 35. Oscar (Jefferson) 25. Overbrook (Love) 20. Owasso (Tulsa) 35. Page (Osage) 35. Pollyanna (Okmulgee) 35. Papoose (Hughes) 20. Pawhuska (Osage) 35. Pawhuska, West (Osage) 35. Pershing (Osage) 35. Pettit (Osage) 35. Phillipsville (Okmulgee) 35. Pickett-Prairie (Creek) 35. Pine (Okmulgee) 35. Pioneer (Osage) 35. Ponca City (Kay) 25. Pond Creek (Osage) 35. Poor Farm (Creek) 35. Prue (Osage) 35. Quapaw (Osage) 35. Rainola (Stephens) 35. Ramona (Osage) 35. Red Bank (Creek) 20. Red Fork (Tulsa) 35. Red River Bed (Tillman) 35. Ripley (Payne) 20. Robberson (Garvin) 35. Sac & Fox (Lincoln) 35. Sacred Heart (Pottawatomie) 35. Sancho (Seminole) 25. Sand Springs (Tulsa) 35. Sapulpa (Creek) 35. Sapulpa, South (Creek) 35. Sasakwa, East (Seminole) 25. Schulter (Okmulgee) 35. Searight, East (Seminole) 35. Seay (Jefferson) 35. Seltzer (Wagoner) 35. Seminole, East (Seminole) 20. Sheldon (Okfuskee) 35. Sheppard (Muskogee) 35. Sholem Alechem (Carter) 25. Simmons-Black (Okmulgee) 35. Skedee (Pawnee) 35. Skellyville (Lincoln) 35. Skiatook (Osage) 35. Slick (Creek) 20. Spaulding (Hughes) 20. Spaulding, Southeast (Hughes) 35. Spencer (Okmulgee) 35. Stillwater (Payne) 25. St. Louis, East (Pottawatomie) 25. Stone Bluff (Wagoner) 35. Stroud, East (Creek) 25. Summers (Okmulgee) 35. Sunset (Osage) 35. Swan (Seminole) 25. Tatums (Carter) 20. Tecumseh, East (Pottawatomie) 25. Terlton (Pawnee) 35. Terlton, North (Pawnee) 35. Tibbens (Creek) 35. Tidal-Osage (Osage) 35. Tipton (Jackson) 25. Tonkawa (Kay) 20. Transcontinental (Muskogee) 35. Turkey Mountain (Tulsa) 35. Turley (Tulsa) 35. Tuskegee (Creek) 35. Velma (Stephens) 35. Walker (Creek) 25. Walker, West (Creek) 35. Walters (Cotton) 35. Webster (Wagoner) 35. Weleetka (Okfuskee) 25. Weleetka, South (Okfuskee) 35. Wetley (Seminole) 35. Wetumka (Hughes) 20. Watumka, South (Hughes) 35. Wheeler (Carter) 35. Wicey (Tulsa) 35. Whitetail (Osage) 35. Wilcox (Creek) 20. Wildhorse (Osage) 35. Wildhorse, North (Osage) 35. Wildhorse, South (Osage) 35. Woolaroc (Osage) 35. Woolsey (Stephens) 35. Wynona (Osage) 35. Yeager, North (Hughes) 20. Youngstown (Okmulgee) 35.

PENNSYLVANIA

All Pools producing Pennsylvania grade crude in Pennsylvania, 75.

All other pools in Pennsylvania, 35.

TENNESSEE

All Pools in Tennessee, 35.

TEXAS

Adami (Webb) 35. Agna Prieta (Duval) 35. Angleton (Brazoria) 35. Appling (Jones) 25. Aviators (Webb) 35.

All pools in Archer County 35, except Burns Ickert, Cooper, Hull Silk Sikes, Hull Silk Sikes Caddo, Kadane, Kadane Shallow, Mankins, Scotland, Scotland Mississippi Lime, Vogtsberger.

All Pools in Baylor County 35, except Rendham, Seymour.

All Pools in Brown County 35.

All Pools in Clay County 35, except Antelope, Antelope Mississippi Lime, Burns Browning, Burns Midway, Halsell, Hapgood, Joy Mississippi Lime, New York City Strawn, Ross, Stephens, Watson, Wynn.

All Pools in Coleman County 35, except Coker, Boyle, Goldsboro, Jim Ned Novice, Novice North, Overall, Silver Valley.

All Pools in Comanche County 35.

All Pools in Cooke County 35, except Bindle, Bindle Ellenberger, Dangle, Fleitmann, Walnut Bend, Walnut Bend-Winger, Wilson.

All Pools in Eastland County 25, except Carbon.

All Pools in Erath County 35.

All Pools in Foard County 25, except Johnson.

All Pools in Haskell County 35.

All Pools in Jack County 35, except Bird-

well, East Grayson, Ellis, Hoefle, McDonald, Meyers, Peex, Peir, Wolfe, Worsham Steed.

All Pools in Jones County 35, except Akard, Appling, Avoca, Avoca, North, Avoca, West, Griffin, Grogan, Hardy, Noodle, South, Sagles, Stitch, Strand, Triplett, Wimberly.

All Pools in Montague County 35, except Benson, Bonita, Barners, Chapman McFarlin, Clingingsmith, Dobson, Forestburg, Hildreth, Hults & Owens, Illinois Bend, Mueller, Mueller Caddo, Ringgold, Rogers & Rogers, Sanders, Stoneburg, Turner.

All Pools in Palo Pinto County 35.

All Pools in Shackelford County 35, except Joy, Nail, Roark-Nail.

All pools in Stevens County 35, except Brownville, Donnell, Hill, Loving.

All Pools in Taylor County 20, except Bowles, Lake Kirby, Merkel, Reddin, Reddin Frazier, Trent.

All pools in Throckmorton County 35, except McKnight, Parratt.

All Pools in Wichita County 35, except Airport, Davidson, K.M.A., K.M.A. Ellenburger, West.

All Pools in Wilbarger County 35, except Consolidated, Electra-Ellenberger, Fargo, Harrold, Main, Potts-Ellenberger, Rock Crossing (Canyon), Rock Crossing (Ellenberger).

All Pools in Young County 35, except Allar, Allar Caddo, Anxac-Graham, Briar Creek, Burns Larimore, Burns Ragland Mississippi Lime, Davis, Garvey, Halbert Caddo, James, Kerlyn Loving, Knight, Knox, Knox, North (Caddo), Knox, Mississippi Lime, Upton McLester, Murray, Murray Caddo, Padgett Mississippi Lime, Servell, Williamson.

Other Texas Pools

Appling (Jones) 25. Bateman (Bastrop) 20. Bateman (King) 35. Bee Creek (Caldwell) 35. Bennett, W. S. Rotan, (Fisher) 20. Bird Island (Kleberg) 25. Blackwell (Coke) 20. Bolivar (Denton) 35. Bolt (Kimble) 35. Bowles (Taylor) 35. Brenham (Austin) 35. Bruni (Webb) 35. Bruni, West (Webb) 35. Buchanan (Caldwell) 35. Burdette Wells (Caldwell) 35. Burnell, South (Karnes) 20. Caesar (Bee) 35. Camada (Jim Wells) 35. Calliham (McMullen) 35. Carbon (Eastland) 35. Cedar Creek (Bastrop) 35. Chapman Abbott (Williamson) 35. Charamousca, South (Duval) 20. Charco Redonda (Zapata) 35. Chicon Lake (Medina) 35. Chiltipin (Duval) 35. Clara Couch (Crockett) 20. Clark (Guadalupe 25. Cole West (Webb) 25. Collinsville (Grayson) 35. Colmena (Duval) 20. Comitas (Zapata) 35. Corsicana Shallow (Navarro) 35. Cowden, Crane (Crane) 35. Crockett (Crockett) 25. Cuellar (Zapata) 35. Currie (Navarro) 25. Dale (Caldwell) 35. Dale, West (Caldwell) 35. Damon Mound (Brazoria) 25. Deep Rock (Andrews) 25. Deupree (Bexar) 35. Diamond Half (Goliad) 25. Dobbs (Ward) 25. Dunlap (Guadalupe & Caldwell) 35. Eckert (Bexar) 35. Ellison Young (Caldwell) 35. El Tangue (Starr) 35. Emperor Deep (Winkler) 20. Escobas (Zapata) 35. Ezzell (Live Oak and McMullin) 25. Fairfield (Bexar) 35. Fleitmann (Cooke) 25. Fostoria (Montgomery) 25. Fromme (Pecos) 25. Frost (Starr) 35. Garza (Garza) 20. Gas Ridge (Bexar) 35. Ginter (Angelina) 35. Goldsmith, North (Ector) 20. Groesbeck (Limestone) 25. Halley (Winkler) 20. Heyser (Calhoun & Victoria) 35. Holbein (Jim Hogg) 20. Huntington (Angelina) 35. Humble (Harris) 25. Hurdle (UPton) 35. Jacob (McMullen) 35. James (Young) 20. Kermit (Winkler) 35. Killam (Webb) 35. Killam, North (Webb) 35. Knight (Young) 25. Knox (Young) 20. Kohler (Duval) 35. Lake Kirby (Taylor) 35. La Reforma (Starr) 25. Las Animas (Jim Hogg) 25. La Vernia (Guadalupe) 35. Lahn (Pecos) 35. Lentz (Bastrop) 20. Live Oak (Crockett) 35. Loma Novia (Duval) 20. Loma Vista (Duval) 35. Lopez (Webb) 20. Los Olmos (Starr) 35. Luby Deep (Nueces) 20. Luling Branyon (Guadalupe & Caldwell) 25. Lykes (Webb) 35. Lytton Springs (Caldwell) 35. Manila (Jim Hogg) 25. Masterson (Pecos) 35. Matthews (Williamson) 35. McMillam (Runnels) 35. Mexia (Limestone) 20. Minerva Rockdale (Milan) 35. Mirando City (Webb) 35. Mirando Valley (Zapata) 35. Moore (Howard) 25. Munson (McMullen) 35. Mykawa (Harris) 25. Netterville (Pecos) 35. Nosch (Williamson) 35. Normann (Bee) 35. O'Connor McFaddin (Refugia) 20. Oilton (Webb) 35. Old Batson (Hardin) 35. Orange (Orange) 20. Overall (Coleman) 20. Panola Co., Bethany (Panola) 35. Payton (Pecos & Ward) 25. Pecos Valley L.G. (Pecos) 35. Pecos Valley H.G. (Pecos & Ward) 35. Peters (Duval) 20. Plummer (Bee) 25. Potter (Marion) 35. Pottsboro (Grayson) 35. Potts-Ellenberger (Wilbarger) 25. Premont (Jim Wells) 25. Pruett (Ward) 35. Quleta (Bee) 35. Rancho Salo (Duval) 35. Rancho Salo Extension (Duval) 35. Randado (Jim Hogg) 35. Rhodes (Cochran) 35. Ricaby (Starr) 35. Richards (Cochran) 35. Richland (Navarro) 25. Rio Grande (Starr) 35. Riddle (Bastrop) 20. Robinson (Duval) 35. Roselyn (Harris) 35. Rotan (Fisher) 20. Royston (Fisher) 20. Sadler (Grayson) 35. Salt Flat (Caldwell) 20. Sam Fordyce (Hidalgo) 25. Sandhills, West (Crane) 20. Sandia (Jim Wells) 35. Sam Fordyce, North (Starr) 20. Saratoga (Hardin) 35. Sarnesa (Duval) 20. Scarborough (Winkler) 20. Sharon Ridge (Mitchell & Scurry) 25. Shearer (Pecos) 20. Snyder (Howard) 25. Somerset (Bexar & Atascosa) 35. South Bosque (McLennan) 35. South Liberty (Liberty) 20. Southton (Bexar) 35. Spiller (Guadalupe) 35. Spindleton (Jefferson) 20. St. Charles (Aransas) 25. Taborg (Pecos) 25. Taylor Inn (Medina) 35. Tehuccana (Limestone) 20. Telferner (Victoria) 25. Thrall (Williamson) 35. Trent (Taylor) 35. Triplett (Jones) 25. Tulsita (Bee) 35. Walnut Creek (Caldwell) 35. Ward, South (Ward) 35. Waskom (Harrison) 35. Webb Ray (Upton) 35. West Andrews (Andrews & Ecton) 35. Westbrook (Mitchell) 20. White Creek (Live Oak) 25. Wortham Shallow (Freestone) 35. Van Shallow (Van Zandt) 35. Victoria (Victoria) 20. Vincent (Howard) 20. Von Gray (Bexar) 35. Yoast (Bastrop) 35. Zaboroski (Guadalupe) 35.

WEST VIRGINIA

All Pools producing Pennsylvania grade crude in West Virginia, 75.

WYOMING

Big Muddy (Converse) 20. Dewey (Weston) 35. G. P. Lesse (Carbon) 35. Grass Creek (Hot Springs) 20. Hidden Dome (Washakie) 35. Horse Creek (Laramie) 35. Iron Creek (Natrona) 35. Kirby Creek (Hot Springs) 35. Osage (Weston) 35. Poison Spider (Natrona) 25. Rex Lake (Albany) 25. Simpson Ridge (Carbon) 35. Spring Valley (Vinta) 35. Teapot, outside Naval Reserve (Natrona) 35. W. Mule Creek (Niobrara) 35. W. Warm Springs (Hot Springs) 25.

PAW to Pass on All Oil Projects Up to $100,000

The War Production Board last week delegated broadened authority to PAW in the handling of oil-industry construction projects, empowering it to pass on projects costing up to $100,000, as against the $25,000-maximum to which it had previously been limited.

Piror to the new arrangement worked out by the two agencies, all industry construction project applications over $25,000 were first approved by PAW and then reviewed and given final approval by the facilities bureau of WPB. Now, all projects up to $100,000 will be handled entirely by PAW, it being estimated that 95 percent of all industry construction will come within the jurisdiction of the Ickes agency.

It was pointed out by Deputy Administrator Davies that the new system will save time and eliminate duplication of effort, expediting the movement of material and equipment to new facilities.

Mineral Oil Polymers Off Monthly Allocation List

Mineral oil polymers, derived from the Grey tower gasoline treating process and used mainly in the manufacture of core oils for metal castings, have been released from monthly allocation control by the War Production Board on the recommendation of PAW.

The polymers were placed under control November 17, 1942, with the PAW refining division making the monthly allocations.

Deputy Administrator Davies explained that the supply now has reached a point where allocation is no longer necessary, as a result of the construction of two new plants and the conversion of existing facilities in several refineries.

Johnston Believes Russia Plans No Exports of Oil

The Soviet Union for many years after the war will be an important market for United States automotive equipment and industrial machinery of all types, including oil industry needs, in the belief of Eric Johnston, president of the United States Chamber of Commerce, just returned from Russia.

At least a decade will be required for the Soviet government to repair the ravages of war and build its industry up to the point where it can provide for its people a standard of living comparable with that in this country, which is one of its aims, Johnston said.

Expressing confidence that Russia will pay for whatever it buys in this country and will live up to any commitments it makes in the way of credits, Johnston told a press conference that he saw no likelihood of the Soviet Union becoming a competitor of the United States in world markets for many years to come.

He foresaw Russia as an exporter of raw materials, as a means of obtaining exchange to finance its purchases, but expressed the belief that such exports will be of things America does not produce, such as cobalt, nickel and platinum, rather than oil, wheat and other commodities which are readily obtainable.

Civilian Fuel Supplies Again Low for Winter

Civilian fuel oil supplies this winter at best will be no greater than last season, and on the East Coast the situation may be as bad as it was in 1942 when transportation was a major problem, the Office of War Information warned July 16.

Although petroleum output is at an all time high, OWI said, military needs are estimated at one fourth the available supply and civilian requirements must be met from a supply one fifth less than in 1943, much of which will go to war plants.

Essential war requirements have increased to a point where there will be an actual shortage for civilian use comparable with two years ago, but the transportation facilities are more flexible than in 1942, it was declared.

Tankers, which accounted for 95 percent of East Coast needs before the war, are now bringing in about 10 percent, it was disclosed.

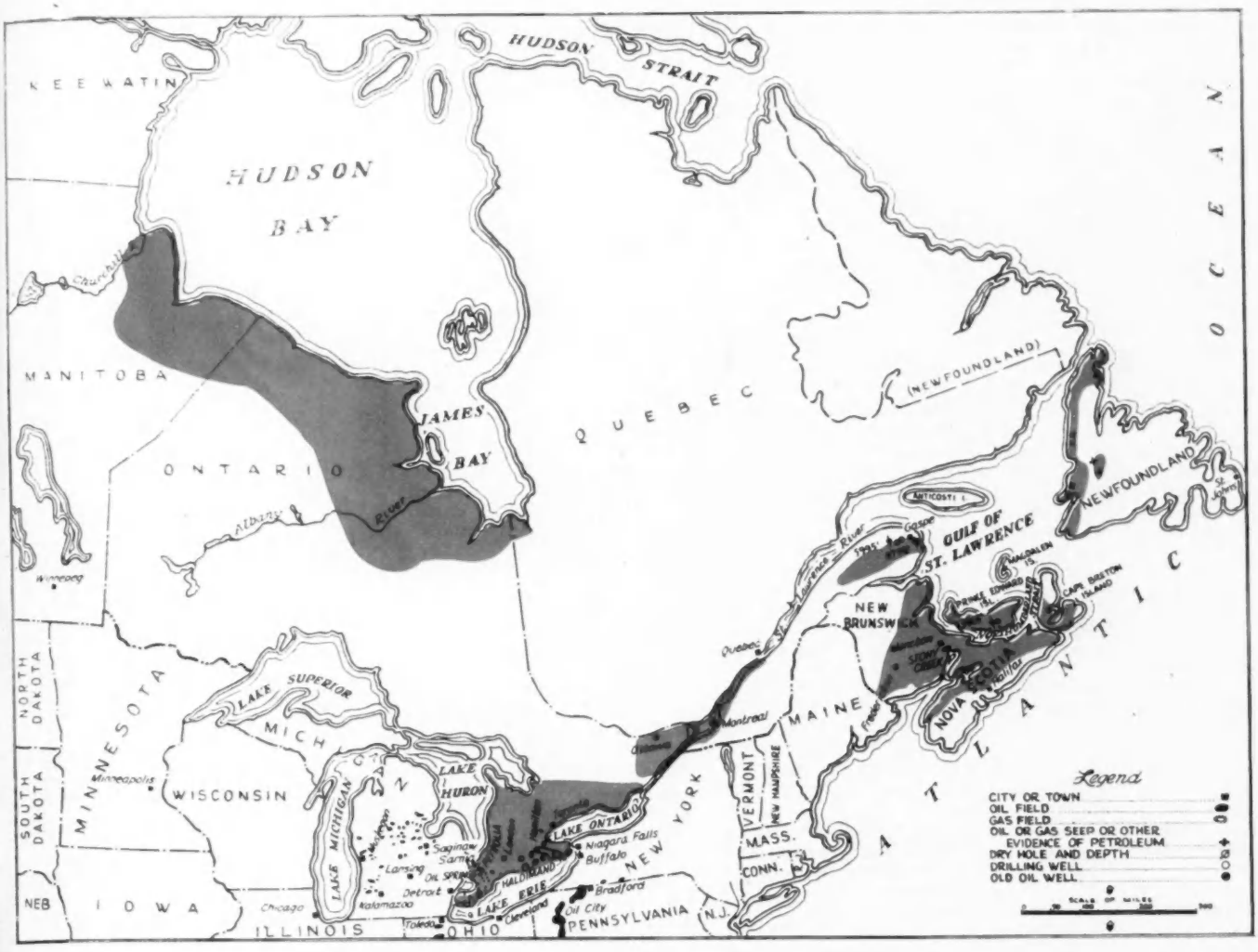
Humble Asks New Division Of Allowable at Hawkins

In the most important proration case to come before the Texas Railroad Commission recently, Humble Oil & Refining Company is seeking a larger share of the allowable from its leases in the Hawkins field, Wood County. The company contends it is the owner of leases under which lie 76 percent of the reserves in the field, but gets only 66 percent of the allowable assigned. Should the company get 76 percent of the allowable, it would be necessary to take 4500 barrels daily from owners of townsite wells, who object vigorously to the change.

The case is the first important proration appeal since the Marrs case in May, when the Texas Supreme Court indicated that the proper method of allocation was that which distributed the allowable in proportion to the reserve in place.

Humble Oil & Refining Company has indicated that if it does not receive a substantial increase in its proportion of the allowable from the field, it will test the order in the courts.

The attorneys for the townsite operators attacked the estimates used by the company in arriving at its reserve figures.



Map of Eastern Canada. Areas shown in red indicate portions which offer possibilities of oil and gas production. Present fields, in southern Ontario and New Brunswick, are shown within these red areas.

Eastern Canada Presents Oil Possibilities

By L. J. LOGAN, Associate Editor

ALTHOUGH Canada looks mainly to its west and northwest for future oil fields to make it less heavily dependent upon foreign sources, there are possibilities for developing new sources of production in the eastern half of the dominion, and some wildcatting currently is under way in exploration of these possibilities.

Areas of established and potential production in eastern Canada are mainly within a comparatively narrow belt centering around Lakes Erie and Ontario, the St. Lawrence River, and the Gulf of St. Lawrence. Although this belt extends from Detroit on the southwest for more than 1200 miles to western Newfoundland on the northeast, it is mainly less than 100 miles wide, with possibilities of oil and gas production offered in several Precambrian basins filled with Paleozoic sediments. Aside from that long and narrow belt, the only portion of eastern Canada with prospects of petroleum production is a coastal plain area in northern Ontario and northeastern Manitoba bordering James and Hudson bays on the southwest, being 75 to 200 miles wide and extending from the south end of James Bay on the southeast to points beyond Churchill River on the northwest, a distance of 800 miles.

Except in the described two regions, eastern Canada, as well as a considerable adjacent part of the western half of the country, is covered by the far-flung Canadian Shield, which consists of Precambrian rocks that offer no prospects of petroleum.

Dominion's western stretches currently considered best for future development but survey shows that eastern section is not without favorable prospect as exploration gets under way

The area adjacent to James and Hudson Bays is part of a basin of Paleozoic sediments in the middle of the Canadian Shield, and the chain of narrow basins along the St. Lawrence waterway system is between the southeastern flank of the Canadian Shield and the northwesterly flank of the Appalachian Mountain system. The Paleozoic rocks yield eastern Canada's only established commercial oil and gas production, in southernmost Ontario and southeastern New Brunswick, and they are the only potentially productive sediments present to be prospected for new fields. However, thicknesses of these lower to upper Paleozoic sediments are great in some areas, although thin in others, and structural conditions favorable for petroleum accumulation are known to exist in nu-

merous areas, while many localities have evidences of petroleum in the form of oil or gas seeps or showings in wells. The Paleozoic rocks which would yield any new fields have furnished important quantities of oil and gas not only in eastern Canada but also, and more impressively, in eastern United States in numerous fields of the Appalachian and Middle Western regions; the belt along the St. Lawrence being a narrow, northeasterly offshoot of the Appalachian oil province of the United States, now in the stripper-well category but the source of large quantities of petroleum in the past.

Subsurface Work Limited

Interest in eastern Canada as a hunting ground for new oil and gas fields has been retarded by various circumstances, including the localization of commercial production so far within a few districts and the accumulation of some geological information of unfavorable implications. However, exploratory drilling and other subsurface investigation have been comparatively limited, and many areas with petroleum producing possibilities are inconclusively tested or wholly untested by drilling; and for any production which may be developed, there will be ready markets, because of proximity and accessiiblity to the more populous sections of the country.

The possibilities for new oil and gas fields in eastern Canada have been discussed comprehensively in a recent Canadian Geological Survey publication, "Petroleum Geology of Canada," by G. S. Hume, geologist for the oil controller for Canada, as well as in the book of the American Association of Petroleum Geologists entitled "Possible Future Oil Provinces of the United States and Canada," by A. I. Levorsen and others. Salient information from those sources is here reviewed briefly and tied in with statistical and other information on wildcatting and current development in the established fields of eastern Canada, to present an over-all view of the development and possibilities of the region. Data for accompanying tables on field development and prospecting in Ontario were obtained through courtesy of A. R. Crozier, acting natural gas commissioner, Ontario Department of Mines, Toronto.

Hudson Bay Region

In the previously defined coastal plains area adjacent to James and Hudson bays, prospects for production appear unfavorable, because sediments are comparatively thin, no seepages of oil or gas have been found, and an exploratory test did not encounter any showings, while any exploration would involve difficulties of accessibility and transport. Orodvician and Silurian sediments, one or both resting on the pre-Cambrian, cover all of the region north of the Albany River and offer less than 500 feet of sedimentation. South of that river, at the southwest corner of James Bay, only Devonian and spots of Lower Cretaceous are above the pre-Cambrian, and even in that district there is only limited area having sediments in excess of 1000 feet thick.

Southern Ontario has furnished the bulk of all commercial oil and gas production in eastern Canada up to now, the only other having been in the Stony Creek oil-gas field, New Brunswick; and southern Ontario has possibilities of additional fields, although they are confined within a comparatively narrow belt along the international boundary. This belt is about 150 miles wide and extends for about 500 miles along Lakes Erie and Ontario and the St. Lawrence River, from the vicinity of Detroit to the province's border beyond Ottawa. However, a considerable area in the east central portion of this described belt, east and north of Kingston, at the northeast end of Lake Ontario, is blocked out as oil-barren, because covered by the Frontenac (pre-Cambrian) axis connecting the Canadian Shield with the Adirondacks in upper New York state. The oil possibilities lie in two pre-Cambrian basins of Paleozoic sediments to the west and east of the Frontenac axis.

The basin to the east of the Frontenac axis lies in the panhandle constituting the southeastern corner of Ontario, between the St. Lawrence and Ottawa rivers, around and south of the city of Ottawa. This basin is bordered by the international boundary on the south, the Frontenac axis on the west, and the Canadian shield on the north and east. It runs for a length of about 100 miles between the rivers and is about 50 miles wide. Within the basin are marine Ordovicion sediments ranging up to 2100 feet thick. Principal oil and gas possibilities are in the eastern half of the basin, to the east and south of Ottawa, in association with a large downfaulted block underlying that corner of the province. No commercial production has been obtained, but gas showings have been found in a dozen wells south and east of Ottawa, on the downfaulted block.

The basin to the west of the Frontenac axis, between Kingston and Detroit, embraces an area in southern Ontario roughly 400 miles long and up to 100 miles wide, bounded on the north by the Canadian shield and on the south by Lakes Ontario and Erie. Within that area the pre-Cambrian gneisses, schists, and granites are overlain by lower Paleozoic sediments of Ordovician, Silurian, and Devonian age, laid down successively toward the southwest. These strata dip gently to the south and southwest and become buried progressively deeper under younger beds, extending on into Michigan and Ohio, where they yield oil at greater depth. In southern Ontario, these Paleozoic strata are covered over by glacial drift ranging from a few feet to 500 feet in thickness. Thus the eastern portion of the basin, as far as the Niagara escarpment at the west end of Lake Ontario, is underlain only by the glacial drift and Ordovician sediments; and for some distance westward there are only Ordovician and Silurian resting on the pre-Cambrian; while still farther west the Ordovician and Silurian are overlain by Devonian sediments.

Niagara Escarpment

The Niagara escarpment, rising abruptly 250 to 300 feet high and responsible for Niagara Falls, represents the outcrop of the Silurian limestones. Beginning at Niagara River, it extends northwest across Ontario and Bruce Peninsula and Manitoulin Island. This escarpment divides the discussed basin into an eastern lowlands half in which oil possibilities are limited to the Ordovician, and a western uplands half which has possibilities in its eastern portion in the Ordovician and Silurian and in its western portion in not only those two groups but also the Devonian present above them.

In the area east of the Niagara escarpment, where the glacial drift is underlain only by the Ordovician, with the Cambrian missing, the Ordovician has a thickness not exceeding 1000 feet and therefore does not offer favorable oil and gas possibilities. Some gas has been encountered along the lake shore, but not in commercial quantities.

Lake Erie Belt

The area west of the escarpment, where the pre-Cambrian is covered by all or part of the series, Ordovician, Silurian, lower Devonian, and middle Devonian, with total thickness ranging up to 4500 feet, contains all the established oil and gas fields of Ontario and offers the most favorable possibilities of new fields. Commercial production has been confined so far to a belt along Lake Erie 200 miles long and 50 miles wide, lying south of a line joining Hamilton and Sarnia. The eastern half of this productive belt, including Niagara peninsula, produces only gas, from over half a dozen fields, including one 40 miles long and nearly that wide. The gas production is principally from formations of Silurian age, including the Guelph dolomite, Clinton limestone, Grimsby sandstone, and Whirlpool sandstone, although there is some gas production from the Trenton formation of the Ordovician in Dover West oil field to the west of the main gas producing area. The western half of the described productive belt of southern Ontario, to the west of London and constituting the southwestern corner of the peninsula of Ontaria, yields gas in several strictly gas-producing fields along the shore of Lake Erie, as well as that in Dover West oil field; but the district produces mainly oil, from about 20 shallow oil fields, which have yielded more than 39,000,000 barrels since the first development in the district in 1861, soon after completion of the Drake well in Pennsylvania, to the east, across Lake Erie. The oil production has come from depths of about 150 to 400 feet, and the bulk of it has been from limestones of Middle Devonian age (Delaware-Onondago formations), although there has been limited production from the older Trenton group of the lower Ordovician (at Dover West field) and some from the Whirlpool sandstone at the base of the Silurian (in the Onondago field).

These fields are in a broad, shallow syncline, in which anticlines of small closure are responsible for the accumulations of oil and gas.

In this area to the west of the Niagara escarpment, several oil and gas fields have been discovered in recent years, and various areas in the district of established fields are considered good prospects, on the basis of subsurface geology and oil and gas showings in wells, no seepages being known outside present field. Oil and gas showings have been obtained north of the Hamilton-Sarnia line in widely scattered wildcats, but prospects of production are limited by thinness of sediments and by the fact that most known Silurian producing formations crop out along the escarpment, making unfavorable much of the 50-mile wide belt of the escarpment where the Silurian is not covered by the Devonian.

Five wildcats currently are drilling in Ontario, at distances of 2 to 10 miles from established fields, as indicated in an accompanying table. Earlier this year an outpost test ½-mile south of the Bothwell field was completed for 2 barrels initial daily production at 380 feet. In 1943, there were 5 wildcat comple-

Wildcats Currently Drilling in Ontario, Canada, or Completed in 1944-1943

Company, Well, Location and Distance from Nearest Town or Field	Initial Daily Prod.	Depth (Feet)	REMARKS
Currently Drilling—			
J. T. Burton's Tinney Bros. 1, Aldborough twp, 5 mi se Bothwell field	.....	....	Drilling
Mid Island Oil Synd's Loosemore 1, Dawn twp, 2 mi sw Oil Springs	.....	....	Drilling
C. J. Bessey's J. Harrington 2, Metcalfe twp, 10 mi ne Mosal field	.....	....	Drilling
W. D. Kennedy's G. Bell 1, Moore two, 10 mi w Petrolia field	.....	....	Drilling
Hunter & Mahler's G. Hunter 1, Raleigh twp, 5 mi ne Tulbury field	.....	....	Drilling
Completed in 1944—			
F. S. Rawlings' J. McWilliams 1, Zone twp, ½ mi s Bothwell field	24 Bbls.	380	Oil Well Comp. Mar. 18
Union Gas Co.'s Brooke 1, Brooke twp, 8 mi e Oil Springs	.....	....	Not yet reported
Completed in 1943—			
Union Gas Co.'s Deleware 5, Deleware twp, 6 mi w London	Dry	1347	.....
R. MacMaster & Son's E. Morrison 1, Nottawasaga twp, 6 mi s Collingwood	Dry	865	.....
Union Gas Co.'s Westminster 2, Westminster twp, 5 mi se London	Dry	1241	.....
R. Arthur Co.'s Well No. 1, Windham twp, 15 mi sw Brantford	Dry	995	.....
Union Gas Co.'s Co. No. 1 Zone, Zone twp, 4 mi w Bothwell	1,275 M open flow	1647	Gas well, rock pr. 720 lb.

tions in Ontario, at distances of 5 to 15 miles from producing fields, including 1 gas producer and 4 dry holes. The gas well, 4 miles west of Bothwell field, was drilled to 1647 feet and registered rock pressure of 720 pounds.

In the proved oil fields, 2 dry holes and no oil wells have been completed this year, in Bell River and Warwick areas, while there have been 56 wells drilled for gas, including 39 producers and 17 dry holes, in Haldimand, Kent, Norfolk, and Welland Counties.

During 1943 there were 18 completions in oil fields of Ontario, including 1 producer in the Raleigh field and 17 dry holes, located in the Warwick, Thamesville, Raleigh, Onondago, and other fields. Within the year there were also 248 wells completed in Ontario's gas fields, including 145 productive and 103 dry, mainly in Haldimand, Kent, Norfolk, and Welland counties.

Producing Wells and Production

At the beginning of this year there were 1728 producing oil wells in the fields of Ontario, of which a large proportion were in the Petrolia-Enniskillen, Oil Springs, Bothwell, and Mosa fields. Annual production of Ontario in 1943 was 132,492 barrels, compared with 143,846 barrels in 1942, bringing the cumulative production for the province to 39,034,158 barrels. Of the 132,492 barrels produced in 1943, 45,308 barrels was from the Petrolia and Enniskillen fields, 27,270 from Oil Springs, 24,244 from Bothwell, 16,327 from Mosa. The 39,034,158 barrels of cumulative production included 7,946,500 barrels at Canada's oldest field, Oil Springs, which still is producing nearly 30,000 barrels per year and which has about 750 oil wells currently productive. The oil has come from an area of about 850 acres, with wells productive at depths of 150 to 400 feet. On the strength of long-known oil seepages, the first oil well, 160 feet deep, was drilled at Oil Springs in 1861, soon after the Drake well in Pennsylvania, to the east, across Lake Erie. Similar production was established in a short time in the Petrolia field, a few miles from the Oil City field, and Petrolia, like Oil City, still is among the several principal producing pools of the region, having 540 wells and having produced over 45,000 barrels in 1943.

Prospects in Quebec

Prospects for oil production in Quebec are confined to two areas along the St. Lawrence River at the southeastern border of the province, all the remainder of Quebec being covered by the Canadian shield. These two areas are the St. Lawrence Lowlands and Gaspé Peninsula.

The St. Lawrence Lowlands, between the Canadian shield on the north and the Appalachian Mountain system on the south, extend from Montreal to Quebec, along both sides of the St. Lawrence River, narrowing gradually from about 75 miles width around Montreal to a triangular point near Quebec. Sediments in the synclinal basin range from lower to upper Ordovician and have maximum thickness of 5000 feet. Limited drilling has not established any commercial production, but oil and gas showings have been found in the Trenton limestones of the middle Ordovician.

On down the St. Lawrence is the Gaspé Peninsula, a part of the Appalachian mountain system, which has long offered promise of oil fields, although only non-commercial production so far has been developed. The prospective oil area is a belt 20 to 35 miles wide extending through the middle of the peninsula for its whole length of 150 miles. The belt is covered by Devonian limestones, underlain by Silurian and Ordovician, whereas the borders of the peninsula to the north and south represent belts underlain only by Ordovician shales and limestones. In the central belt there are anticlinal and synclinal folds, cut by faults. Evidences of oil are present in Ordovician, Silurian, lower Devonian, and middle Devonian, in the form of bituminous shales, oil stained limes, oil seepages, and non-commercial oil production from wells, some of which have continued to produce for more than 80 years. The small production and the most promising prospects have been in the central eastern end of the peninsula, especially in the drainage basins of the York and St. John rivers, within a region extending about 40 miles from east to west and 10 miles from north to south, the oil possibilities being mainly in the Devonian but perhaps also in the Silurian.

Some Early Drilling

First drilling occurred in 1860, and between 1889 and 1902 an English syndicate, Petroleum Oil Trust, drilled about 60 wells in the area, some of which were over 3000 feet deep and many more than 2000 feet deep, A few yielded gas or small production of oil (several barrels per day), and while most of the wells were dry, very few were favorably located in relation to structures, most of them having been at or near synclinal axes, rather than up the flanks of anticlines. Furthermore, two deeper tests of recent years, although favorably located, did not reach horizons which offer oil possibilities. Imperial Oil Company's Mississippi Anticline 1, east of Dartmouth Lake, drilled in 1939 to 5995 feet, was located well up the flank of an anticline but only penetrated lower Devonian and would have had to go 2000 feet deeper to test the Silurian and Ordovician. The same company's Haldimand Anticline 1, near Gaspé Bay, drilled in 1941-1942 to 4770 feet, did not penetrate sandstones to reach underlying limestones. About mid-way between the Imperial locations and 15 miles due west of the village and ocean Harbor of Gaspé, Continental Petroleums, Ltd., Montreal, in 1943 began drilling No. 1 well on the Galt anticline, where Devonian sandstones are eroded through to the underlying limestones, and at the end of 1943 the well had reached 2124 feet in limestone. Zero weather and snow then stopped drilling, but the well may be drilled on through the Devonian to the Silurian if production is not found at higher levels, having been projected as an 8000 foot test. While excavating for the foundations for the derrick at this site and after getting down to bed rock and penetrating into the limestone, the operators encountered live petroleum, they reported. At 833 feet the well encountered a flow of gas with some showings of oil, both the gas and oil coming through a fractured zone at that horizon. Continental Petroleums, Limited, also has shipped in machinery for drilling No. 2 well, projected 2500-foot test, about 8 miles west of No. 1. Location

Wells Completed in Oil and Gas Fields of Ontario in 1943 and First Quarter of 1944

OIL FIELDS

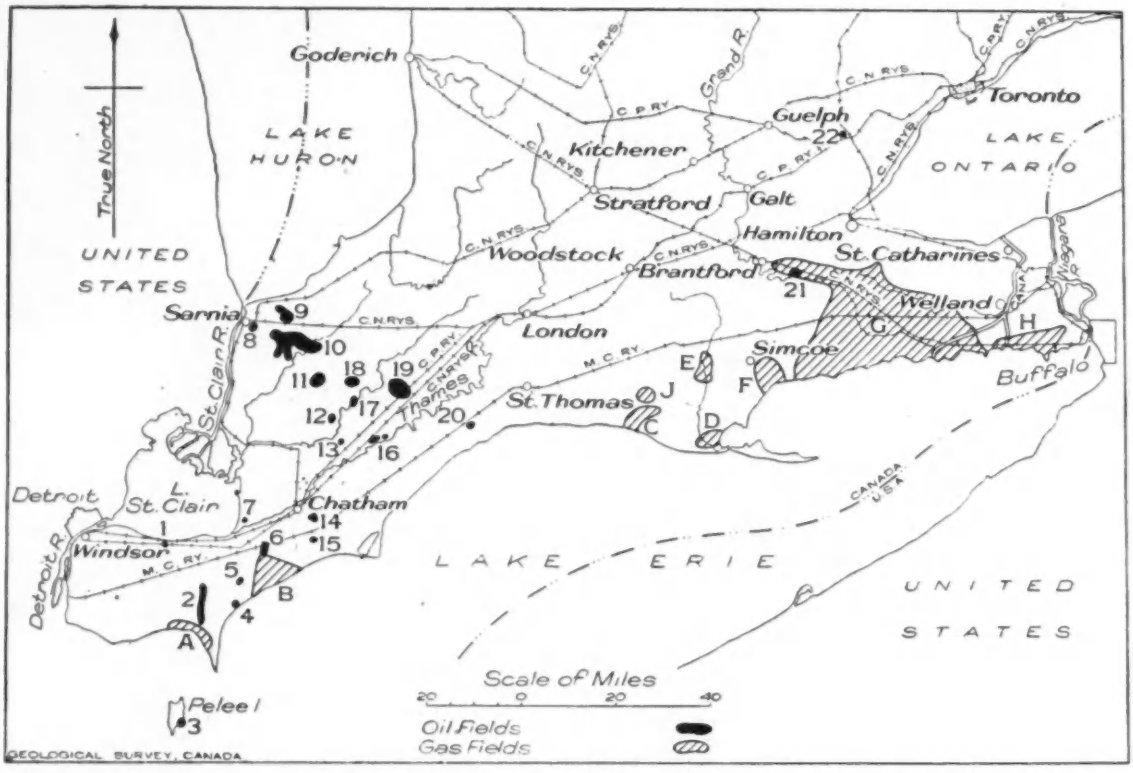
FIELD	Oil Wells	Dry Holes	Total Wells	Total Footage
Year 1943—				
Warwick	..	4	4	1809
Thamesville	..	1	1	422
Raleigh	*1	3	4	1802
Onondago	..	2	2	1199
Other Fields	..	7	7	?
Total 1943	*1	17	18	5232+?
1st 3 Mos. 1944—				
Belle River	..	1	1	560
Warwick	..	1	1	426
Total 3 Mos. 1944	..	2	2	986

* One producer at 5 barrels per day.

GAS FIELDS

FIELD	Gas Wells	Dry Holes	Total Wells	Total Footage
Year 1943—				
Haldimand Co.	90	38	128	....
Kent Co.	10	9	19	....
Norfolk Co.	19	27	46	....
Welland Co.	10	6	16	....
Other Areas	16	19	35	....
Total 1943	†145	103	248	....
1st 3 Mos. 1944—				
Haldimand Co.	27	7	34	....
Kent Co.	..	1	1	....
Norfolk Co.	6	7	13	....
Welland Co.	6	2	8	....
Total 3 Mos. 1944	39	17	56	....

† Total new open flow in 1943 was 11,415 M.



Oil and gas fields of southern Ontario. Oil fields: 1, Belle River; 2, Leamington; 3, Pelee Island; 4, Wheatley; 5, Romney; 6, Tilbury; 7, Dover West; 8, Sarnia; 9, Plympton; 10, Petrolia; 11, Oil Springs; 12, Dawn; 13, Thamesville; 14, Kipp; 15, Raleigh; 16, Bothwell; 17, Euphemia; 18, Brook; 19, Mosa; 20, Dutton; 21, Onondaga; 22, Milton. Gas fields: A, Leamington; B, Kent; C, Bayham and Malahide; D, Port Rowan; E. Middleton; F, Simcoe; G, Haldimand; H, Welland; J, Brownesville.

of No. 2 is in the immediate vicinity of an old well, Petroleum Oil Trust No. 20, which is still yielding 2 to 5 gallons a day of light amber-colored, 49-gravity oil from the 6⅝-inch casing, after having been completed more than 40 years ago.

Some favorable structures in eastern Gaspé are untested by drilling, and if commercial production should be discovered, exploration very likely would spread westward to other structures throughout the central belt of the peninsula.

New Brunswick and Nova Scotia

Containing the Stony Creek oil field, new Brunswick is Eastern Canada's only commercially productive province besides Ontario; and the possibilities for new fields in Nova Scotia as well as New Brunswick center around the mentioned field. This prospective oil area embraces the southeasterly half of New Brunswick and roughly the northern half of Nova Scotia; also Prince Edward Island and the Magdalen Islands. Outside this favorable area are uplands underlain by pre-Carboniferous metamorphosed sediments and igneous rocks, including middle Devonian, which are ruled out as oil prospecting ground. Within the more promising regions are Carboniferous strata (Mississippian and Pennsylvanian), believed to be largely non-marine, and each formation being remarkably thick; these strata being folded and faulted, with folds generally trending northeast-southwest.

Stony Creek field, discovered in 1909, is about 9 miles south of Moncton. It embraces an area about 3 miles long and 1½ miles wide, and gas production has been developed on about 1200 acres, while oil production has been developed on about 275 acres. The production occurs on the south flank of an anticlinal fold within the north limb of a synclinal basin, and comes from sandstone lenses in shales of the Albert formation, Horton series, lower Mississippian, at depths of 1500 to 3000 feet. The field currently is producing about 60 barrels of 37-gravity oil per day and about 1,650,000 cubic feet of gas daily. About 20 oil wells, 2500 to 3000 feet deep, were drilled at Stony Creek in the past 20 years, during which production ranged from 20,000 to 30,000 barrels annually. The field produced 25,405 barrels in 1943, compared with 26,879 in 1942, and cumulative production from discovery 35 years ago to the end of 1943 was 344,425 barrels. Stony Creek produced about 600,000,000 cubic feet of gas in 1943 and at the end of the year had to its credit cumulative production of over 19,000,000,000 cubic feet. The field is operated by the New Brunswick Oil & Gas Company, Ltd., which also operates a small gasoline topping plant in the area.

It is believed that other oil and gas fields similar to Stony Creek may be found in New Brunswick in basins containing Mississippian sediments, although subsurface prospecting will be needed to find them where covered by Pennsylvanian strata. The Albert shales occur in a basin 50 miles long, from Elgin to the Mamramcook valley, and 20 to 30 miles wide, to the north of Caledonia Mountain. Outside Stony Creek field, about 25 wildcats have been drilled since 1909, but some were unfavorably located in relation to known structures. Various areas in the district have given indications of petroleum in the form of oil and gas seeps, asphaltic residues, and albertite, a solidified asphalt, all associated with the Albert

■ CONTINUED ON PAGE 24

Number of Oil Producing Wells in Fields of Ontario, Canada, and Annual Crude Oil Production in 1943 and 1942

FIELD	No. Wells Producing Jan. 1, 1944	Annual Production of Crude (Barrels) 1942	1943
Moore	7	806	332
Romney Tp	2	81	54
Dover	8	8,494	9,322
Sarnia	18	237	305
Plympton	2	24	26
Petrolia and Enniskillen	540	51,917	45,308
Oil Springs	752	27,369	27,270
Orford Tp	17	*	*
Dawn	1	327	126
Thamesville	7	1,979	1,664
Aldborough	1	*	*
Raleigh	3	.....	‡
Bothwell	172	26,054	24,244
Warwick	10	6,524	5,967
Euphemia	14	270	114
Metcalfe	5	†	.....
Brooke	1	77	.....
Mosa	136	19,209	16,327
Dunwich	19	358	1,422
Onondago	12	120	11
Chatham Tp	1	.....	.....
Total Ontario	1,728	143,846	132,492
Cumulated prod. 1861-1943, at Oil Springs, from about 850 acres			7,946,500
Cumulated prod. 1861-1943, total Ontario			39,034,158

* Included in Bothwell. † Included in Warwick. ‡ Included in Dover.

Methods for Shooting Thin Multiple Sand Zones

Greater care in shooting wells called for as petroleum demand increases. Former hit and miss method gives way to scientific approach that requires careful advance study of the different formations, degrees of hardness, porosity, permeability, density

By ANTHONY GIBBON, Staff Writer

THE need for conservation of dwindling petroleum resources today, as never before, emphasizes the need for greater care in shooting wells so as to assure the greatest protection for the bore hole and at the same time obtain proper fracturing of producing formations so that they will give up the maximum of oil and gas. Oil companies and individual operators know that shot engineering can have a direct bearing on profits, operating costs and ultimate recovery and consequently greater attention is being given to "placing the shot," old hit-and-miss methods being relegated to the scrap pile of antiquated and obsolete oil field practices.

Selective or multiple zone shooting, to be successful, requires careful study particularly in areas where the formation is varied as to degree of hardness, porosity, permeability, consolidation, density and saturation. Problems arise and must be worked out where saturated zones of either uniform or varied type are separated by fault zones or other non-saturated zones of varied thickness.

THE accompanying discussion was undertaken to throw some light on the application of the principle of multi-zone shooting to areas and conditions not heretofore more or less specifically and thoroughly covered by H. M. Ryder, F. R. Cozzens and H. F. Simons, with all of whom this article is in general agreement as to principle and objective if not as to practice or results in all respects.

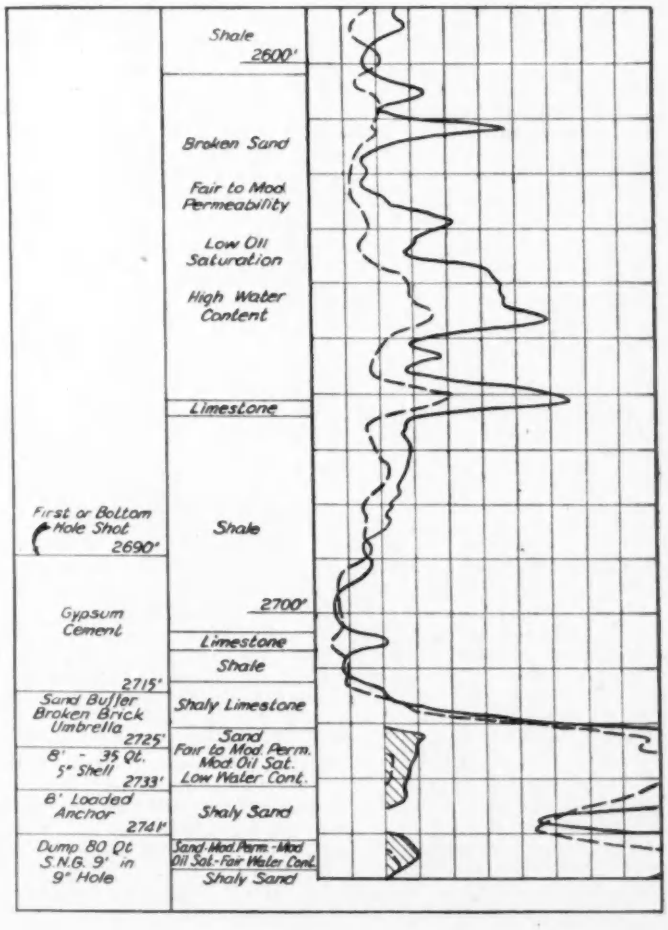
Pre-shooting Studies

In order to obtain uniform results from a shot the operator should first study the constitution or structure of the rock stratum and its reaction to shock. At the same time the type of explosive to be used should be such that in relation to strength, density and velocity it will insure the widest fracturing range in each zone and it is obvious that no single explosive acting with the same velocity throughout the length of a continuous column of the same diameter could produce the best results in rocks having varied density and shock resistance.

To establish a shooting program, especially in a new oil field, it is desirable to use all criteria available from drilling reports and the electric log, correlating and analyzing these data to determine the various loading densities throughout the zones to be shot, and by means of calipers checking the results from varied loading density. In other words, the operator should establish a "norm" in shooting the first well and assemble all data available for an index to future shooting. Analysis of surveys could be developed into graph form and would prove valuable guides to future shooting technique for each pool.

Where multiple-zone shooting is planned involving rock characteristics of varied type, the desirable procedure is to determine the type of explosive best suited for each zone and then to use in that zone the quantity of explosive which will give the widest economical fracturing range. The ideal condition would be to have a wide choice of explosives but since, for the present, under wartime conditions, the choice of explosives for oil-well shooting is limited, every preliminary step should be taken in the well survey to insure utmost efficiency and economy with existing limited material. Besides studying the characteristics of zones to be shot the operator would benefit by learning something of the nature of available explosives and what to expect from their use.

It is true that each individual field, and, to some extent, each well has its own problem and therefore, there is no "rule of thumb" which might be generally applied to well shooting as a whole. However, much can be accomplished by avoiding what is now con-



Well No. 1: Selective shooting of two saturated zones separated by shale break.

sidered in some quarters, the wasteful practice of arbitrarily placing a continuous column of explosives of the same diameter throughout the entire pay zone regardless of character. By that practice, the optimum degree of shot efficiency is lost and high cleanout and maintenance costs can be expected.

Conditioning of Hole

Another factor of prime importance is conditioning the hole. Wherever possible, especially when the well has been completed with rotary tools to total depth, the hole throughout the pay zone should be thoroughly washed down with water. Sometimes pressure conditions require that the hole be filled with mud and in that case it is desirable that the lightest mud commensurate with safety be used and that it be so mixed as to exclude as far as possible objectionable pore sealing solids or colloidal matter. This point is of particular importance where the shot is closely confined by cement or other solids since it is there that the explosive gases while hot will, if they exceed the formation pressure as they almost always momentarily do, force such sealing solids and colloidal matter back into the pore spaces and shot fractures where they may obstruct and detract from the benefit of the shot. It is a wise precaution where well shooting operations are to be carried on at night and where the derrick or rig is electrically illuminated to see that the rig is thoroughly grounded. Grounding the rig is a good safety precaution at all times, as static electricity and stray currents are a constant source of danger and might well have been the contributing cause of some of the unexplained explosion disasters. Time spent in cleaning and conditioning a well for shooting is time well spent.

Successful shooting of multiple-pay zones requires a complete, accurate and comprehensive log of the well, as well as accurate measurements and a chronological sequence of drilling time, supported by cores, drill cuttings and other data. The operator must also consider the frangibility factor of pay zones and should use this criteria in preference to that gleaned from drilling time or rock bit wear. This is true because highly frangible rocks require less explosive energy than poorly consolidated or less frangible rocks. While a rock bit may wear out faster on a sandstone, such sandstone may require less explosive energy (quarts per foot) than some limestone or dolomitic rock.

Where a stratum is thick and soft and lies between two harder strata and where liquid nitroglycerin is to be used, the soft strata may be straddled by means of loaded anchor, or by common anchor if the stratum is thin. This also applies where a non-saturated zone or fault zone or break is to be straddled. No precise control of the explosion effect can be expected above or below the shot zone except where the shot is closely confined to a zone by means of gypsum or other cement. Therefore, unless the gypsum or other cement is employed, straddling of productive zones two feet or less in thickness is generally useless for all practical purposes, this being indicated by caliper survey logs which rather uniformly show greater bore enlargement above or below the actual shot zone where either stratum was softer than that in the shot zone.

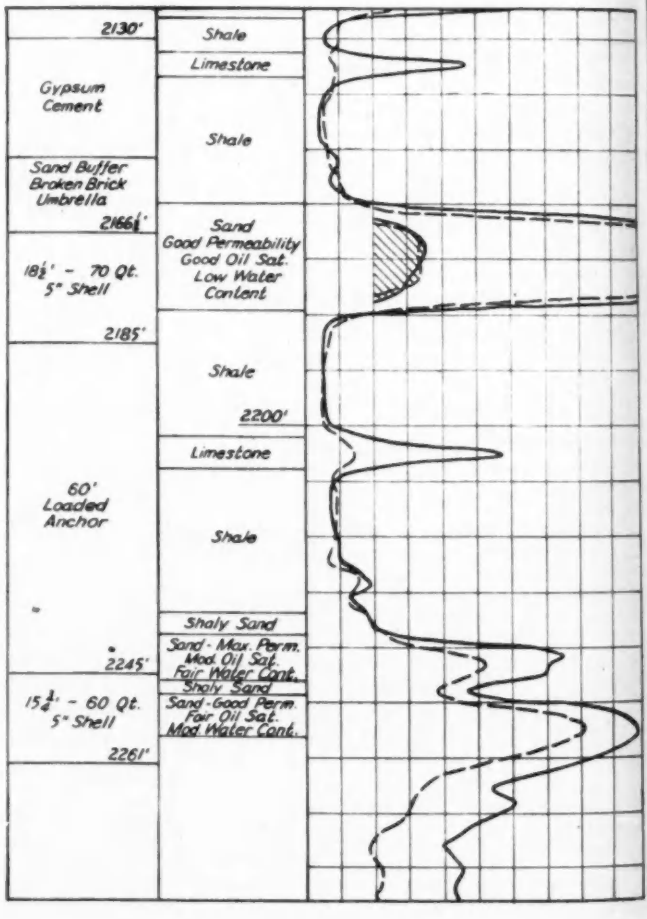
Unless conditions exist which make it uneconomical, separate shots are recommended where two or more geologic formations to be shot are separated by more than ten feet. If solid stemming is employed, the upper shot may be set on all or part of the stemming covering the lower shot after the latter has been exploded. Where two separate shots in the same hole are to be exploded simultaneously, care should be taken to connect them so that they can be exploded by a single bomb or other detonator. It readily can be seen that if two shots are placed in the same hole at the same time with separate detonators, if one should fail, there would be no way of determining which of the shots had failed, whether the upper or lower shot, or if the one fired had caused the other to fire by propagation, thus confronting the operator with a dangerous situation. Where a single formation varying in hardness is to be shot and no thick breaks to be straddled, the torpedo diameter may vary to suit the condition. In using solidified nitro-glycerin exclusively, the shell should be not less than three inches in diameter to permit it to sustain a wave of detonation especially when subjected to hydrostatic pressure. Where liquid nitroglycerin is used the column may vary in diameter from 1¼ inches to within 1 inch of the well's diameter; for example, a 5-inch shell in a 6-inch hole, etc. Where selective shooting is employed and close control required, liquid nitroglycerin is preferable to solidified nitroglycerin.

Considerable benefit can be derived from shots placed opposite lower strata where explosive energy results in fractures radiating upward, this being especially true where the saturated zone is a limestone or sandstone of high porosity and permeability and poorly consolidated in relation to strata above or beneath. In extreme cases the operator should avoid placing shots directly opposite such sections, as the explosion pressure has a tendency to compress rather than fracture rock of low crushing strength.

Determine Frangibility

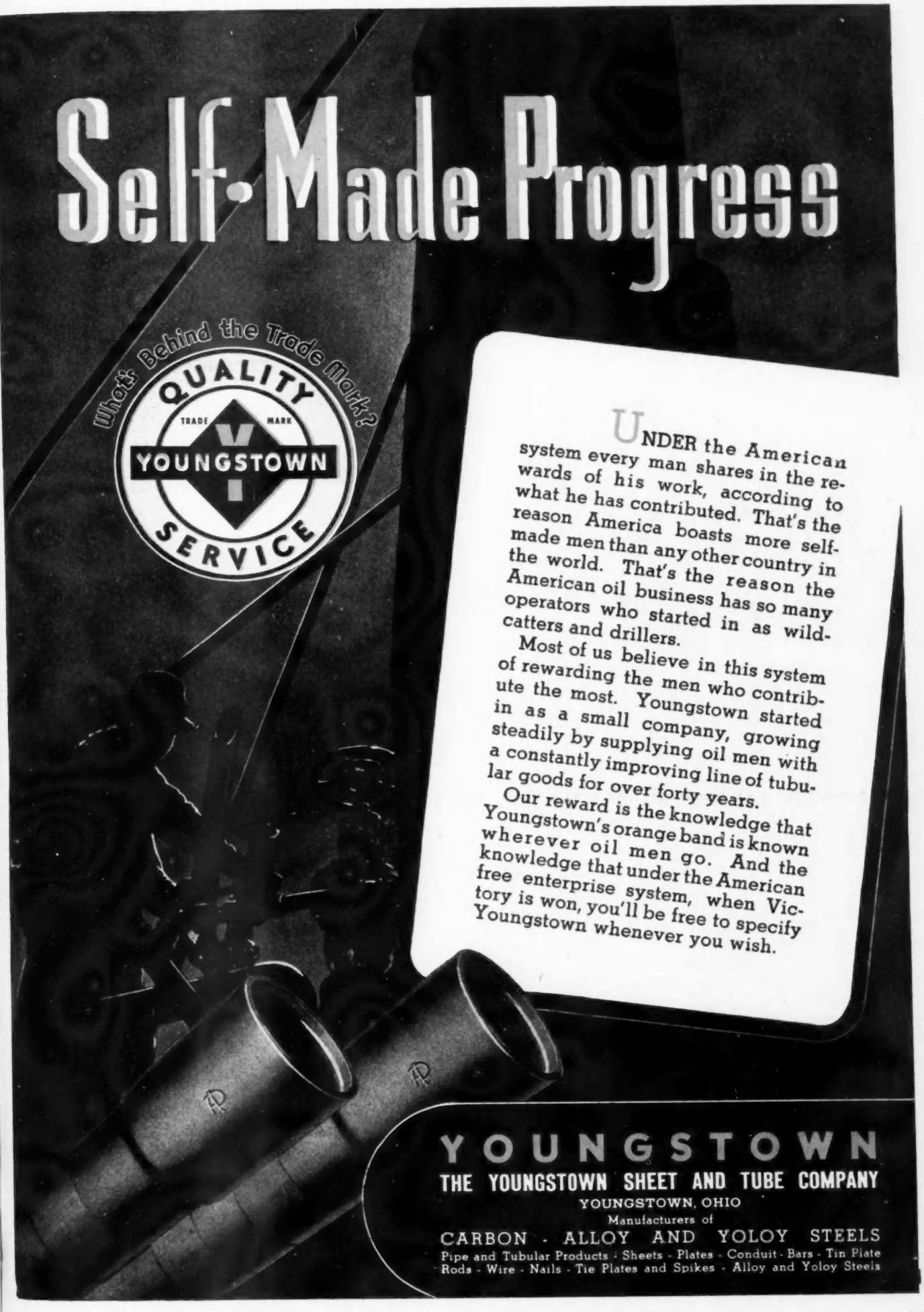
Frangibility is that property of a rock that indicates its fragility and elasticity and the operator should make every effort to establish the frangible characteristic of the rock or formation to be shot. Where no laboratory facilities are available in the field, comparative frangibility can be established with the crushing strength test and this can be done at the well by taking a ball-peen hammer and striking a sample of the rock or by dropping a weight to determine the crushing effects. Producing formations may be roughly segregated into limestones, sandstones, and dolomites. The average crushing strength in pounds per square inch are 8750 for limestone, 5000 for sandstones and 10,000 for dolomite. However, it must be considered that at the present time no practical frangibility value or index has as yet been determined which would give the exact answer to the frangible or infrangible character of various rocks and so in the field the operator must be guided by the "feel" of the rock.

In connection determining the characteristics of rocks and how they may best be shot, the operator might in new



Well No. 2: Multiple shooting two saturated zones widely separated by shale and limestone where either of two methods can be employed. Note: While cost would be greater, the results would justify shooting these two zones separately, tamping lower zone with sand and setting upper shot on the stemming used for the lower shot.

Self-Made Progress



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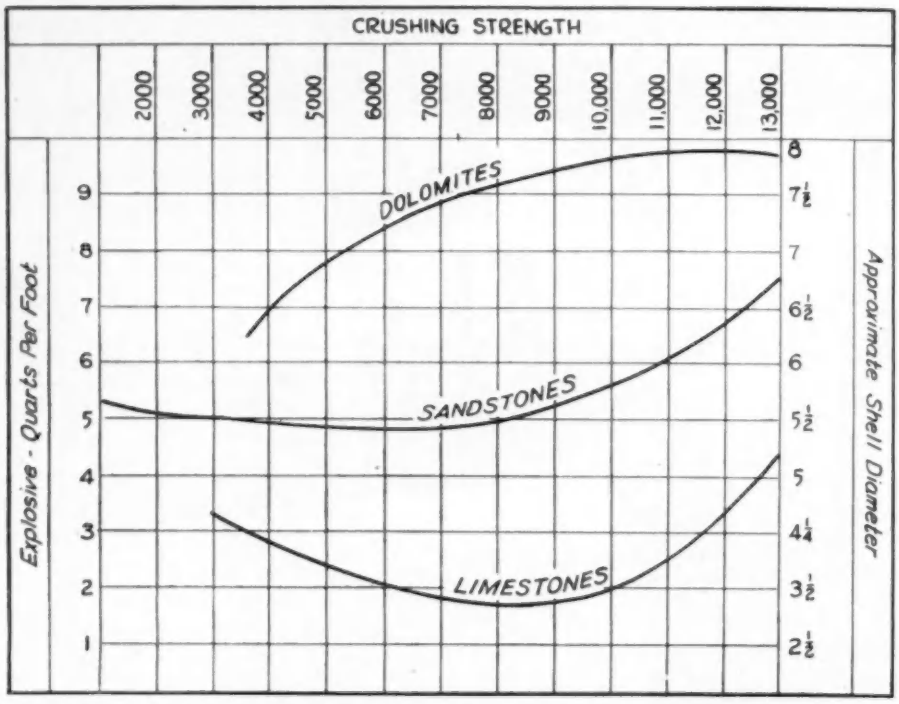

SHOOTING FORMULA FOR USE WHERE NO SHOOTING DATA ARE AVAILABLE

In using the formula (immediately below) and data it must be remembered that all stones vary widely in frangibility, a factor for which no practical mathematical value has yet been determined. Hence, the value of "E" in the Lewis formula should vary between 4,000,000 and 6,500,000 somewhat in conformity with the curves in the above graph.

Comparative Strength of Various Frangible and Unfrangible Materials

	Range	Average
Glass	27,582	.....
Bricks	650 to 5,000	.....
Granite	5,000 to 17,000	.....
Limestone	3,500 to 14,000	8,750
Sandstone	2,000 to 8,000	5,000
Dolomite	5,000 to 15,000	10,000

territory apply the empirical formula presented some years ago by Paul F. Lewis at a meeting of the Illinois Chapter of the API. The formula is intended only for use as a starting point where no other experience data is available as to optimum loading density best suitable for the three principle rock groups, limestone, sandstone and dolomite and should be used in conjunction with the accompanying chart which shows shell capacity, loading density and rock characteristics.

Formula: $L = \frac{Vw + W}{E}$

Where:

L = The explosive charge in quarts

V = The effective volume of overburden

w = The average weight of overburden in pounds per cubic foot

W = The crushing strength of oil bearing stone

E = The explosive energy at *4,000,000 foot-pounds per quart of 100 percent explosive

Example: Assume a 1000-foot well, completed with 20 feet of 8-inch hole in average limestone; and it is desired to crack the formation on a horizontal plane through an assumed average radius of 70 feet then,

$V = 3.1416 \times 70^2 \times 20$ or 307,877 cu. ft.

Assuming that the force of the explosive will have a maximum vertical range of 100 feet, then V. becomes:

307,877 × 5 — 1,539,435 cubic foot

Approximating w on the basis of the average weight of limestone = 150 cubic foot. Vw = 1,539,435 × 150 = 230,915,250 pounds total weight of overburden to be acted upon.

W = Surface area of bore hole through the pay section times the crushing strength of the rock in pounds per square inch (8750 pounds square inch) = 52,778,863 pounds square inch.

$L = \frac{283,694,113}{4,000,000} = 70$ quarts approx.

With the development of deeper drilling, the torpedo man is confronted with the problem of varying geothermal temperatures in the bore hole. Where bottom hole pressures are extremely high, temperatures also are invariably high and trouble may be expected in the form of spontaneous premature explosion as the critical temperature of liquid nitro-glycerin under confinement is somewhere between 150 and 180 degrees F. Subjected to such temperatures or higher, which may be encountered in deep wells, progressive decomposition begins. To guard against this contingency a stabilizer is added to the explosive charge. Part of the conditioning of a deep hole for shooting should include ascertaining bottom hole temperatures so as to determine whether a stabilizer should be added to the shooting charge.

*Equals 80 percent of potential which is calculated to be 2,000,000 ft. pounds per pound.

Eastern Canada

■ CONTINUED FROM PAGE 20

formation, which contains oil shale beds regarded as the source of the petroleum.

In Nova Scotia there are black shales from which oil can be distilled near New Glasgow, these shales being in the Pictou series of upper Pennsylvanian. In the Mabou area a Boston syndicate made a seismic survey in 1942 and proposed drilling, which has not yet been undertaken. Imperial Oil Company, Ltd., in 1930, drilled a well on the Scotsburn anticline, near Scotsburn, Pictou County, obtaining small oil showings in lower Pennsylvanian and upper Mississippian, in drilling to 1980 feet to test the Horton formation, which embraces the Albert zone, productive at Stony Creek, New Brunswick. Imperial Oil in 1931 also drilled a test on the Minudie anticline near Amherst, Nova Scotia, about 25 miles east of southeast of Stony Creek field, quitting at 4132 feet when it was indicated that the hole would have to be carried to 6000 or 8000 feet to reach the Albert zone of the Horton. The Lake Ainslie district, Cape Breton Island, Nova Scotia, has attracted attention through globules of oil rising to the surface of the lake. This oil occurrence is believed related to the Horton formation of the Mississippian, which is here covered by large thickness of Pennsylvanian beds. Anticlines, synclines, and faults are known in the Lake Ainslie area, in a structural basin that extends across Cape Breton from the west coast through Lake Ainslie to the northwest coast. However, several deep tests in the area have failed to develop production.

Deterrents to prospecting in New Brunswick and Nova Scotia include absence of live seepages of oil or gas and the prevalence and great thicknesses of sediments considered non-marine.

Those same unfavorable factors also have deterred exploration on Prince Edward Island, immediately to the east, where a half dozen government-financed 2000-foot tests and a deep test found no favorable indications in beds considered upper Pennsylvanian and of fresh water origin. The deep test was drilled in 1925-1927 by Henry L. Doherty & Company of New York on small Governor Island, in Hillsborough Bay, adjacent to Northumberland Strait, which separates Prince Edward Island from New Brunswick and Nova Scotia. The location was on an indicated large structure mapped by surface geology. Although it went to 5965 feet, the test did not reach bottom of Pennsylvanian red beds and did not find any showings of oil. In hope of reaching Mississippian beds under the Pennsylvanian, by drilling to much greater depth than that reached in the Doherty well, a projected 12,000-foot test was started some months ago on the same structure, less than a mile southwest of the early test, by Cities Service Oil Company and Socony-Vacuum Oil Company, on piers in Hillsborough Bay, the location having been selected with benefit of seismic surveys.

Magdalen Islands, northeast of Prince Edward Island, have upper Mississippian rocks, largely covered by 300 feet

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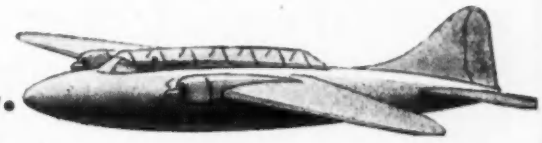

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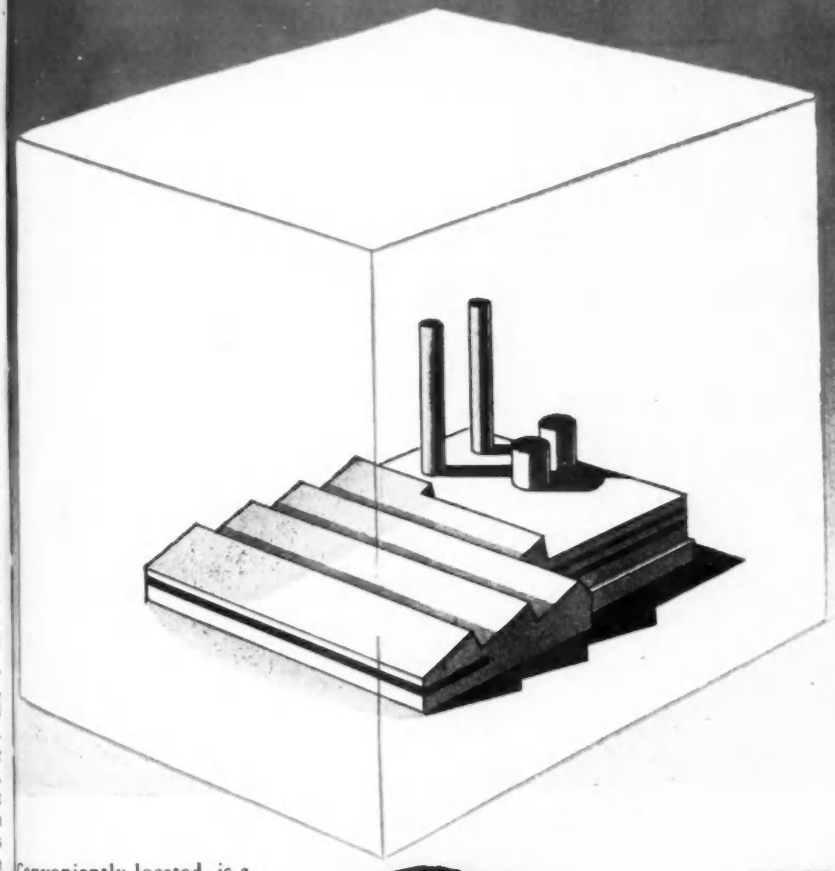

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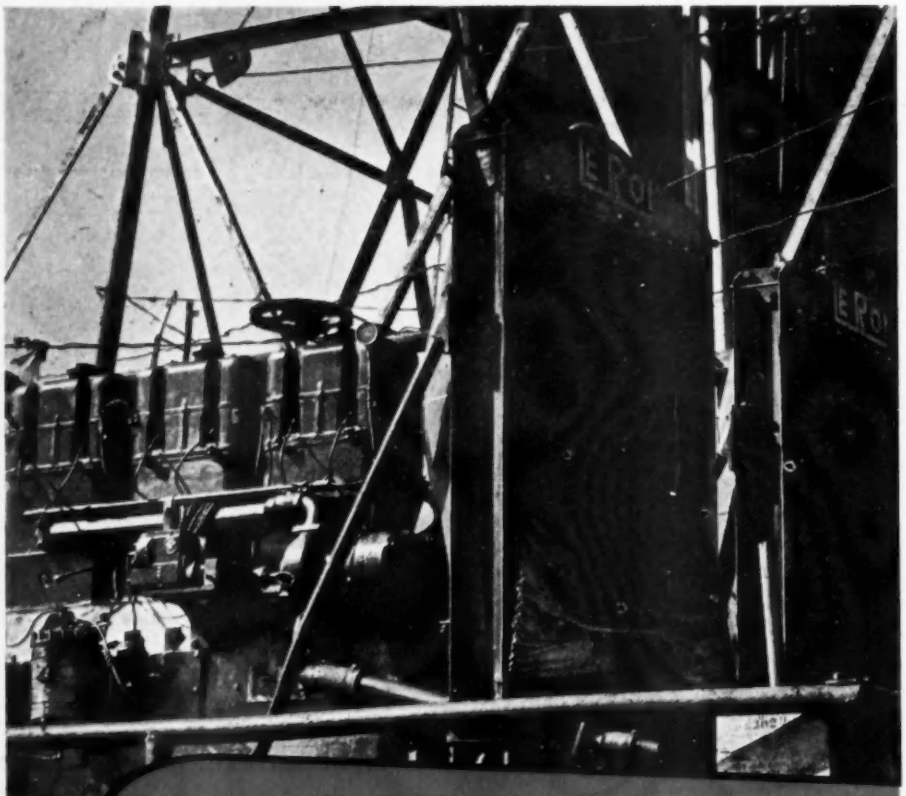

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or more of Pennsylvanian age sandstone, and presence of much volcanic material is an unfavorable factor, along with absence of oil or gas seepages.

Newfoundland Has Oil Seeps

Newfoundland is largely covered with the oil-barren pre-Cambrian gneisses, schists, and granites, but there are oil seeps and oil producing possibilities in Paleozoic sediments of Cambrian, Ordovician, Devonian, and Mississippian age within a narrow lowlands belt, not exceeding 25 miles wide, along the western coast, and at the northern end of the island around Hare Bay. There are oil seepages and non-commercial oil wells on the western coast near Port au Port on St. George Peninsula north of Bay St. George and farther north, about midway up the coast, at Parsons Pond and St. Pauls Bay. The oil is from the Ordovician in that western coastal area, which is underlain chiefly by Cambrian and Ordovician sediments ranging up to 10,000 or 12,000 feet in aggregate thickness. Absence of gas pressure in the small wells is an unfavorable factor.

On the northeast coast, oil seepages and outcrops of bituminous shale are present at Piliers Bay, where there is a small coastal fringe area of Mississippian sediments, 4000 or 5000 feet thick, on a structure extending under the sea. But the prospects of commercial production are not rated high. Oil shales and seepages of bitumen occur to the south of Piliers Bay near Conche and also 150 miles farther south at Deer Lake and Grand Lake, in Mississippian sediments, which range from a few feet to 3000 feet in thickness. However, no liquid petroleum or gas have been found in test drilling, and prospects of oil and gas fields are not promising. Another area in Newfoundland offering possibilities of oil is a strip about 15 miles wide along Bay St. George where Carboniferous strata exceed 14,000 feet in thickness and where structures may be found beneath the surface glacial material. In that area, encouragement for oil prospecting is given by bituminous limestones cropping out along the shores of the bay.

Canadian Operators Seek Further Tax Concessions

The Alberta Petroleum Association has asked Canadian Finance Minister J. L. Isley to re-draft a proposal in his latest budget speech concerning a tax concession to stimulate greater wildcat drilling in the dominion. The budget resolution included a recommendation to grant a tax credit to apply on 50 percent of the cost of any well drilled in selected wildcatting areas, and spudded between June 26, 1944 (the date of the resolution), and March 31, 1945, if such wells prove to be unproductive.

The Alberta association, while approving of the intent of the concession resolution, has pointed out that the June 26 effective date will penalize at least 36 operations started a few weeks prior to that date and otherwise eligible for the tax discount. It is suggested that the provision be revised to cover these wells, and be retroactive to March 31, 1944, according to a letter forwarded to the minister by the Alberta group.

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Deferment for Servicing Men Essential

By A. R. McTEE, Staff Writer

SHORTAGES in personnel of servicing organizations operating within the oil industry constitute a grave threat to continued high levels of production and exploration. As the need for more wells and greater production increases, the supply of available men to carry on these necessary operations diminishes. This vicious cycle has been intensified in proportion to the drafting of men for the military services. It shows little or no sign of becoming better, and may get much worse depending upon how acute the need for more men in the armed forces becomes.

It is with full knowledge of this situation and its meaning to the oil industry that the manpower sub-committee in District 3 has appealed to the labor counselor for PAW. He has been asked to use all his influence to keep key men over 26 on their jobs, by appealing to national headquarters of Selective Service and asking for special consideration for such men engaged in the oil industry.

The seriousness of manpower shortage to the servicing concerns was emphasized by a survey of such companies made by the manpower subcommittee early in May. Questionnaires were sent to servicing organizations in District 3, and 18 replies were received, representing 2009 employes. It was shown that the industry can expect to lose the help of 50 units with the drafting of all men under 26. If all men in the next age group, from 26 to 30, are drafted, 97 servicing units will have to close up. When all men under 38 go, 198 servicing units will shut down.

The whole process of finding and producing oil has become so technical, with scientific apparatus playing such a major part, that servicing organizations are indispensable. They have become a fundamental branch of the industry, holding the key to progress within the industry, and are certain to increase in importance.

The catalog of these services is long, including among the necessary activities, well surveying, electric logging, other types of logging, casing perforating, shooting, cementing, directional drilling, bit servicing, tool setting, treating, welding, testing, work-over and plug-back operations, mud service, rig building, fishing service, core analysis, etc. As was stressed by the subcommittee to the labor counselor, "This branch of production operations consists of highly trained skilled men who perform, for the most part, infrequent, necessary services for all producing companies and drilling contractors. Usually these services are of such importance that operations are held up until they can be performed. Many servicing companies hold their own patents on various types of tools and equipment which they have invented and are used only by them. These services are available at all hours, day or night, and often the successful completion of a well may depend upon their quick response."

About 5000 trained, highly skilled men make up the servicing branch of the industry. In addition many assistants and helpers are required. The trained men are very hard to replace due to requirements of ability, judgment, and experience. Many services performed are highly technical in nature and cannot be learned quickly.

The survey indicates that drilling and production operations are being retarded and "in some areas held up indefinitely, due to inability of servicing companies to operate because of lack of trained personnel to perform necessary functions which they alone are equipped to perform." Already extremely hard hit through withdrawal of men by Selective Service, the servicing companies will be unable to continue their full scope of operations if men over 26 are taken. Also irreplaceable men under 26 should be deferred.

The labor counselor's office has indicated to Selective Service that special consideration of some kind must be given to these key men engaged in oil production as soon as it becomes necessary to induct men over 26. Frederick H. Harbison has replied to the subcommittee in District 3, that "It is our understanding that men 26 and over will not be taken on a large scale until all available men under 26 are taken on a nationwide basis." He urges operators to contact the office of the labor counselor "if, for any reason particular state directors in your area should issue orders for the induction of men 26 and over." The counselor will at once call the situation to the attention of Selective Service, "pointing out again the necessity for proper consideration of employes engaged in oil production."

Up to this time, the labor counselor has recommended deferment for approximately 275 men under 26 years of age engaged in technical services vital to production of oil. As far as is known, state directors have concurred in the recommendations. Harbison says that "It is the intention of PAW to press for a continuation of the present deferments when they expire. We cannot, of course," he says, "promise that Selective Service will agree with us on this score, but we can pledge that we will make diligent efforts to make our recommendations stick."

OIL WELL SERVICING COMPANIES

(Survey made by the PIWC Manpower Sub-Committee, PAW District 3)

Companies reporting	18
Employes represented	2009
Employes under 18	117
Employes aged 18-26	135
Employes aged 26-30	203
Employes aged 30-38	482
Employes over 38	604
Employes classified 4F	352
Women employed	118
Units in operation	376
Average number of men per unit	6
Average hours worked per week	60.6
Anticipated manpower needs for April-May-June	241
Anticipated manpower needs for July-August-September	179
Units to be shut down if all men under 38 years old are drafted	198
Units to be shut down if all men under 30 years old are drafted	97
Units to be shut down if all men under 26 years old are drafted	50

Specialists in Their Field

The present criteria for deferments of men under 26 cannot be changed, and those who have not been deferred have either been inducted or are scheduled to be in the very near future. The labor counselor assures the industry, however, that "the criteria which may be set in the future for men 26 and over will give special recognition to men of practical experience and less emphasis to formal educational requirements." This point is paramount to the servicing organizations, for as has been pointed out, many men in this type of work are highly skilled and perform work of semi-technical nature, and even though they do not have technical degrees they are specialists in their field.

For example, as cited in the recommendations to the Labor Counselor, "A well-servicing company fishing tool expert is called by an operator only when bits, drill pipe, slips, screen, rods, casing, tubing, etc., have dropped in, and must be recovered from the bottom of the well. Poor judgment, improper selection or improper application of fishing tools in these cases, may cause the 'fish' to be pushed to the side of the hole or otherwise put in such a condition that recovery is highly improbable, and often impossible. This may result in drilling holes being abandoned or producing wells being plugged or having their ultimate recoverable crude production impaired. There are many types of fishing tools available to the fishing tool expert; however, in some cases it is necessary for him to design and have constructed special tools to meet special requirements. This example can be applied in like manner to experts in all fields of the production branch of the industry where expert specialty men are required. Many of these men are considered 'trouble shooters,' and through their ability to solve special problems that arise in the exploration, drilling, and producing of crude petroleum, have saved the industry vast amounts of material and man hours of work."

Deferment of this type of men on the basis of education illustrates the fallacy of too much emphasis on formal education as a basis for deferment.

The labor counselor has asked for a list of essential activities of servicing companies and the manpower sub-committee is now preparing such a list which will be available soon. This list should be of much help.

It has been recalled by the manpower sub-committee that the percentage of deferments granted to men under 26 in exploration; drilling, production and oil field servicing, is low in comparison with deferments granted such men in other industries. At the same time emphasis was put on the fact that the production branch of the industry represents more total employes than any other branch.

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Ladle, pouring

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Practical Completion of Secondary-Recovery Wells

Proper input well completion by either packer settings or selective shooting offers much aid in controlling movement of water used to drive out "profit" oil. Vertical physical variables of the sand itself must be equalized

DEVELOPMENT of a property for secondary oil recovery by re-pressuring or flooding involves drilling of new input or producing wells, or use of existing wells. The decision as to whether or not new drilling is warranted should be based on physical and economical factors relevant to the particular case under consideration. The problem is basically one of economic and recovery efficiency. If core analysis or precedence in the area shows sufficient increased recovery may be obtained by complete or part re-drilling it should most certainly be done, if all other conditions are favorable.

Advisability of new development depends upon local conditions and competent analysis should be basis of decision for possible re-drilling. It is particularly advisable to drill new input wells, regardless of the type project being developed. This permits a "designed" input well completion and aids in the introduction of the flushing or driving media into that portion of the sand from which the "profit" oil is to be recovered. In other words proper well completion is merely an attempt to equalize vertical physical variables of the sand itself. Admission that like variables may exist to a degree in a horizontal plane from input to producer does not deduct from the value of proper completion.

New wells should be cored, analyzed and treated as an individual unit. Air or gas pressure wells should not be shot or acidized while advisability of shooting water input wells depends upon character of sand. Selective shooting tends to equalize vertical sand characteristics for a sufficient distance from the input well to permit formation of a uniform "wall of water."

Two Factors

It should be remembered that (1), air, gas or water injected into an oil sand will naturally expand and migrate in the path of least resistance and (2), this path may contain only a small portion of the sand saturation.

Variation of permeability and oil saturation determines to a large degree the completion method which should be followed. Selective shooting in water input wells and packer setting in air or gas input wells are usual methods used to aid the injected media in doing effective work. The problem involved is that of maintaining a uniform front for the injected media as it moves from input to producer.

In re-pressure input wells packers should be set at points of considerable variance in permeability and/or saturation. Minor variations in either should be overlooked. Injected volumes should be converted to reservoir volumes and volumes introduced to each packed off zone be approximately abreast of the others in a horizontal plane. Otherwise the zone of low resistance in the sand (high permeability) will be flushed of a considerable percentage of its recoverable oil and the injected media will henceforth follow the same path, recovering little oil, and leaving the tight sand zones unflushed.

Tightness and saturation of any zone determine largely the pressure necessary for injection. Accordingly, injected volumes should be converted to reservoir pressures, surface metered volumes and pressures being converted.

Selective Shooting

Generally speaking variable sand conditions in water flood input wells are corrected by selective shooting, the idea being that heavy shooting of tight sections and light shooting of loose sections more or less equalizes the sections from a resistance to flow viewpoint and permit formation of a uniform flood front, or profile at least to the shot's limit of affect. Obviously water applied with a uniform pressure in uniformly shot wells in a variable sand will not move with a uniform horizontal velocity in all vertical sand zones. Speed of migration through each zone is in ratio to permeability of each, moving faster through the loose or highly permeable sections.

Once the injected media reaches producing wells in quantity through any zone, that particular zone may be considered as being practically flushed of oil. When this condition is reached that particular zone must be plugged off so that the tight zones may be flushed or considerable oil may never be recovered. Difficulties arising from use of old producing wells as inputs is readily visualized.

Hook wall or anchor packers, either single or multiple settings and tubing strings are commonly used for re-pressuring wells, while water inputs usually have a single cement packer, set in cap or top of saturation, with 50 to 100 feet of cement grout on top. Packers are used to insure injection into the sand, and prevent thiefing by shallower strata.

Must Clean Hole

Prior to installation of injection equipment in an input well the hole should be thoroughly cleaned and the fluid level lowered as much as possible. Sediment or fluid in the hole increases difficulty of injection.

If the sand is uniform and there is to be no segregation of zones, packer installation may not be required. Injection through casing has proven satisfactory in some cases for both types of projects, provided casing has a sound seat, no leaks and there are no thief formations exposed.

Prior to commencement of operations, all old wells should be thoroughly cleaned out, particular care being taken with those which may be used for inputs. Accumulations of paraffin, sand and other material should be removed. Mechanical condition of the well should be checked, defective pipe replaced, zones of non-oil saturated sand plugged off, liner setting, re-shooting or other corrective work done, necessary to put all wells in first class shape.

Following installation of equipment immediate injection is desirable, but not mandatory. Immediate injection minimizes amount of fluid and foreign matter which may enter the hole, tending for better injection.

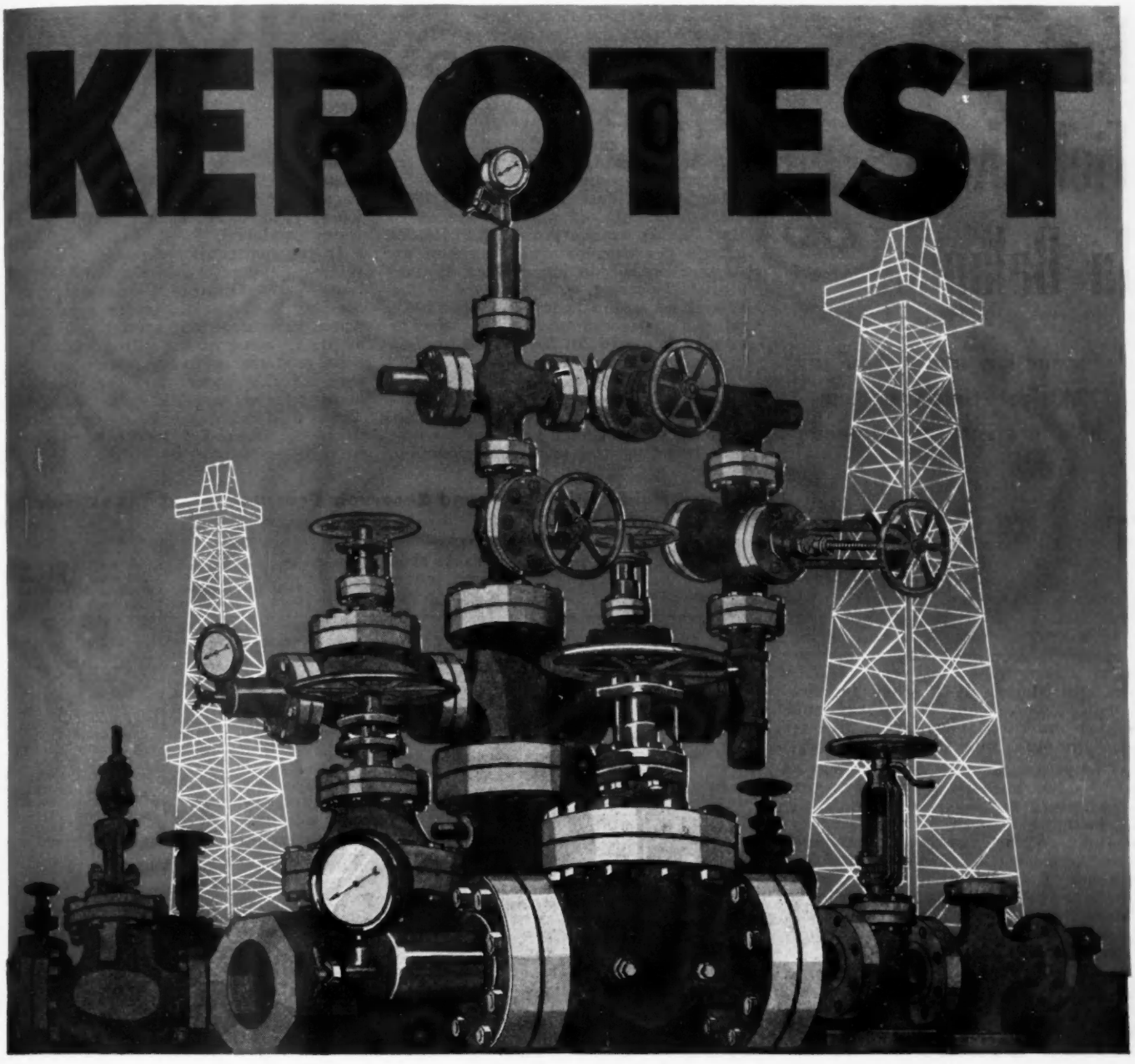
Removing Chemical Scale

In either method of secondary recovery the sand face may become coated with sediment which should be blown off by stopping injection, blowing re-pressure wells or backwashing water wells. Chemical scale removing action may be required but most sand pore clogging sediment does not. Cases are not uncommon when input pressure is lowered appreciably, or nearly halved, by reversing flow and blowing what appeared to be not over a few handfuls of scale from the sand.

If old producers are used as inputs conventional cleaning out procedure does not always present a clean sand, especially in those pools where paraffin has proven troublesome. Following pressure build up in the sand, some wells must be blown many times to bring paraffin and sediment from the sand adjacent to the well bore. Wells of this nature may give a derrick a liberal coating of paraffin before cleaned.

In projects where more than one input well is used, an essential part of each well's completion schedule is the running of injection characteristic tests to obtain injection pressure versus volume relationships. Such data prove most valuable in determining source of channeling or bypassing of injected media should such a condition later develop.

Fundamentally the objective of a "designed" input well completion is to equalize large vertical variables in the reservoir, if practical, by selective shooting or packer setting.



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East Texas Field Kept In Balance

Production more than in 1943 yet field's bottom-hole pressure maintained

THE daily average oil-producing rate of the East Texas field during the first six months of 1944 has been 14,643 barrels greater than during the year 1943, yet the field's bottom hole pressure has shown practically no decline. The decrease in bottom hole pressure so far during 1944 has been materially less than during 1943, when the field produced more than 2½ times as much oil per unit loss in reservoir pressure than any other time during its history.

This remarkable record, no doubt, is due to the pressure-maintenance program, which has involved return to the producing formation of a larger percentage of the salt water produced than heretofore. Thus, the total net amount of fluid withdrawn from the reservoir has been smaller although more oil has been produced, and consequently the beneficial effect on bottom-hole pressure.

During the first six months of 1944 oil production averaged 366,994 barrels per day. The average bottom-hole pressure of the field on January 1, 1944, was 1012.44 pounds per square inch and on June 1, 1944, was 1012.29 pounds per square inch—a decline of only 0.15 pounds during the period. Daily average oil production during the year 1943 was 352,351 barrels, and during the year the bottom-hole pressure dropped 3.27 pounds. It is believed that as long as the net fluid withdrawals from the East Texas field approximates the record of the first six months of 1944, the bottom hole pressure will be maintained to a remarkable degree.

Data indicate that for the first six months of this year, the total reservoir fluids produced average 874,952 barrels per day. When the salt water returned to the sand (323,648 barrels daily) is subtracted from this amount, the "net fluid withdrawal per day" was 551,304 barrels, which is believed to be within the optimum range of withdrawals from the East Texas field. During 1943, the total reservoir fluids produced averaged 846,334 barrels, or nearly 30,000 barrels less than the average for 1944. However, only 201,706 barrels of salt water were returned to the producing formation in 1943, and consequently the net fluid withdrawal amounted to an average of 644,628 barrels in 1943. These statistics indicate that an increase of 121,942 barrels in daily average water-injection rate in 1944 has resulted in a 93,324-barrel reduction in the net fluid withdrawn per day from the reservoir when compared with 1943, although the total production of fluids has been higher and explains the field's better performance record.

During the first six months of 1944, the volume of salt water produced in East Texas was estimated at 410,403 barrels per day, of which amount an average of 323,648 barrels per day, or nearly 79 percent, were returned to the Woodbine sand. During the year 1943, salt-water production averaged 400,129 barrels, but only 201,706 barrels, or but 50.41 percent, were returned to the sand.

If water production is decreased or the amount returned to the sand increased, the amount of oil produced can be increased in direct proportion without disturbing the pressure-production relationship. The Railroad Commission of Texas has recently restricted the amount of bonus oil that will be granted on large water-producing wells, which has had the effect of shutting off approximately 30,000 barrels of water per day. The wells affected have been abandoned or taken off production because they were no longer economical to produce. A program of plastic plug back work in the East Texas field also has served to reduce the volume of water produced.

In the matter of returning additional water to the reservoir, the East Texas Salt Water Disposal Company is extending its lines to leases producing water heretofore not served and is, in addition, constructing three new disposal systems more adequately to take care of the water. All these trends point to the possibility of the East Texas field being able to produce additional oil, if needed, in the war effort, without serious damage to the field.

Total Fluid Withdrawal and Reservoir Pressure—East Texas Field

Data From Railroad Commission Records

MONTH	DAILY AVERAGE PRODUCTION—Barrels				Water Injected Per Day	Net Fluid Withdrawal Per Day	Reservoir Pressure 1st of Mo. Lb./Sq. In.
	Oil (Tanks)	Oil (Reservoir)	Salt Water	Total Fluid			
1942							
October	358,326	453,577	375,966	829,543	87,007	742,536	1,020.71
November	353,090	446,949	373,862	820,811	88,933	731,878	1,016.24
December	356,633	451,434	394,000	845,434	95,319	750,115	1,017.12
1943							
January	324,678	410,985	371,160	782,145	102,059	680,086	1,015.71
February	323,533	409,535	374,751	784,286	124,755	659,531	1,020.55
March	324,308	410,516	380,244	790,760	137,064	653,696	1,016.14
April	350,578	443,770	390,720	834,490	160,829	673,661	1,020.44
May	339,010	429,127	387,335	816,462	176,727	639,735	1,019.16
June	334,380	423,266	388,459	811,725	190,923	620,802	1,016.21
July	368,641	466,634	410,921	877,555	208,555	669,000	1,016.98
August	368,182	466,033	418,098	884,131	214,942	669,189	1,012.22
September	379,444	480,309	412,330	892,639	243,542	649,097	1,008.46
October	367,703	465,447	412,432	877,879	265,979	611,900	1,010.60
November	378,835	479,538	426,643	906,181	283,148	623,033	1,007.62
December	367,224	464,841	427,653	892,494	306,811	585,683	1,007.41
Total (1943)	128,608,187	162,795,173	146,047,001	308,933,725	73,622,670	235,546,431	.....
Daily	352,351	446,014	400,129	846,334	201,706	644,628	.....
1944							
January	365,808	463,048	393,169	856,217	312,801	543,416	1,012.44
February	389,811	493,432	404,487	897,919	325,522	572,397	1,010.20
March	364,945	461,956	405,000	866,956	325,582	541,374	1,003.47
April	360,510	456,342	415,000	871,342	329,834	541,508	1,008.50
May	363,190	459,734	420,000	879,734	321,806	557,928	1,011.26
June	358,696	454,046	425,000	879,046	326,765	552,281	1,012.29
Total (1944*) Daily	366,994	464,549	410,403	874,952	323,648	551,304	—0.15

* First six months.

Salt Water Produced and Injected—East Texas Field

Data From Railroad Commission Records

MONTH	Salt Water Produced—Bbls.		Salt Water Injected—Bbls.		Percent Injected	No. Prod. Days
	Month	Daily Average	Month	Daily Average		
1942						
October	11,654,946	375,966	2,697,220	87,007	23.14	22
November	11,215,860	373,862	2,667,973	88,933	23.79	21
December	12,214,000	394,000	2,954,901	95,319	24.19	22
1943						
January	11,505,960	371,160	3,163,849	102,059	27.50	20
February	10,493,028	374,751	3,493,127	124,755	33.29	18
March	11,787,564	380,244	4,248,994	137,064	36.05	20
April	11,721,600	390,720	4,824,863	160,829	41.16	21
May	12,007,385	387,335	5,478,541	176,727	45.63	21
June	11,620,050	388,459	5,727,688	190,923	49.15	20
July	12,738,551	410,921	6,465,220	208,555	50.75	23
August	12,961,038	418,098	6,663,214	214,942	51.41	23
September	12,369,900	412,330	7,306,248	243,542	59.06	23
October	12,785,392	412,432	8,245,351	265,979	64.49	23
November	12,799,290	426,643	8,494,446	283,148	66,37	23
December	13,257,243	427,653	9,511,129	306,811	71.74	23
Total (1943)	146,047,001	400,129	73,622,670	201,706	50.41	..
1944						
January	12,188,234	393,169	9,696,855	312,801	79.56	23
February	11,730,136	404,487	9,440,126	325,522	80.48	23
March	12,555,000	405,000	10,093,056	325,582	80.39	23
April	12,450,000	415,000	9,895,010	329,834	79.48	22
May	13,020,000	420,000	9,975,973	321,806	76.62	23
June	12,750,000	425,000	9,802,956	326,765	76.89	22
Total	74,693,370	410,403	58,903,976	323,648	78.86	..

Blowouts—
Their Causes and Prevention

PART 2

Preventing Causes Under Control of Subordinate Personnel

Causes under control of subordinate personnel include drilling gas sands too fast, pulling drill pipe off bottom too rapidly, balling up bit or drill collar, use of low-pressure fittings in high-pressure control manifolds, delay in making repairs to rig, lack of vigilance for unmistakable signs of gas and other such lapses. Forceful poster treatment of each condition is outlined

By MADDEN T. WORKS,
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POSTERS are suggested as a highly effective medium for presenting an educational program to workmen, which should return exceptional dividends in preventing blowout causes under control of subordinate personnel. Posters could be designed to call attention to the various hazards and to explain why certain things are bad practice.

Part 1, published in THE OIL WEEKLY of June 10, 1944, discussed preventing blowout causes under control of management, and suggested a group study leading to a series of papers and also the reporting of details on each blowout to a central technical group, which could disseminate new ideas and methods.

This paper was presented before the Spring Meeting of the Southwestern District of the American Petroleum Institute's Division of Production, June 13-14, 1944, Houston, Texas.

THE value of a practical educational and safety program has been stressed by all writers on the subject of blowout prevention, and it is strange that so few operators have adopted such a program in view of the fact that practically no expense is involved. It has been stated many times that blowout occurrence can be successfully controlled only through close coordination and team work. As stated by Carpenter[6]:

"Each workman should be warned of dangers attending a blowout and be instructed in safe methods of prevention. Explanation of the design, function, and operation of different kinds of preventive equipment should be included in the instruction, with special emphasis placed on its manipulation. There is no substitute for actual practice as a means of learning to operate any mechanism, and daily drill periods for each crew of workmen are strongly recommended. A 'blowout drill' serves to test all preventive equipment (blowout preventers, flow-line valves and pumps) and to furnish workmen practice in its manipulation.

"Blowout Drill" Plan

"Blowouts often occur when least expected, and quick action is necessary to prevent serious damage. To facilitate coordination, each member of the drilling crew should be assigned to a post of duty to which he should go immediately when an alarm is sounded ... Each 'blowout drill' should be pursued with as much diligence and dispatch as any other part of the drilling operations and should be fully executed. Regular practice will promote better teamwork and tend to eliminate confusion, which sometimes exists as a result of excitement and fright."

Also, Vietti and Levy[3] offer the following: "the point must be emphasized that, after installation of the most satisfactory of the various available methods of control, then the safety program is up to the operative personnel. A good, careful driller will have the least trouble, because he is essentially a safe workman. He must be allowed to play safe and he must not be pushed for footage at the expense of safety. Above all, his supervisors must be blowout conscious. Blowouts may and will be prevented if the whole organization is behind this important safety program. Such a program will return exceptional dividends to the operator."

A well planned educational and safety program is particularly essential during war times, as the caliber of drilling crew personnel has been forced to an all-time low. It appears from replies to questionnaires that some companies leave the matter of blowout education up to their safety department. The effectiveness of this plan is questioned for it is doubtful that there are many safety engineers who are qualified to deal except in a superficial manner with the necessary safety factors required in preventing blowouts. Specific suggestions on the education of workmen to make them blowout conscious are offered in this paper. If management can be made to realize the importance of education from the standpoint of blowout insurance so that they will institute a planned program, a backhanded, but nonetheless beneficial, result would accrue in that in planning an educational program for the workman it would be necessary that the operators make a study of the subject and, hence, would be better educated themselves.

Poster Educational Program

Whereas it is almost impossible to offer an educational program which will effectively impress management, the problem should be much simplified when dealing with subordinate personnel such as the drilling crew. One medium which should be highly effective but which has apparently been overlooked is posters similar to those seen around machine shops dealing with such safety precautions as the use of safety goggles, etc. Safety posters around some drilling operations usually are designed to reduce injuries to personnel by calling attention to various occupational hazards. Since it is a well known fact that we learn more through our eyes than through our ears, it seems that the poster medium of education offers great possibilities in creating blowout consciousness in the workmen. An examination of each of the causes of blowouts under the control of subordinate personnel, would result in visualization of posters which would not only call the workmen's attention to the various hazards but would also give information on the basic reasons as to why certain things are bad practice.

Causes Under Control of Subordinate Personnel

The field of poster design is one entirely foreign to the author. However, in interest of illustrating the point, let us examine each of the causes of blowouts which may be corrected by the men in the field, and attempt to suggest an educational poster devoted to each cause.

II-a. Drilling gas sands too fast. The underlying reason for not drilling a gas-bearing sand at too rapid a rate is that gas which is contained in the voids of the formation being drilled becomes mixed with the drilling fluid as the bit penetrates the gas-bearing strata and, thus, causes the drilling mud to become gas cut and lightened to the extent that it will not overcome the formation pressure. This is a very simple concept, but one wonders how many present day drillers realize that this is what the superintendent has in mind when he instructs him not to drill a doubtful sand at faster than a given rate.

It seems that this instruction, together with the reason for it, could be well covered in a graphical manner by a poster. For example, a poster might be headed "Don't Hurry When Drilling Gas Sands." Below this there might

be three schematic and somewhat fanciful cross-sectional drawings of the well bore and the derrick. The first drawing would show in suitable colors the hole full of mud which weight is holding back pressures in shallower formations, these pressures being represented by little devils, and the drilling bit just entering a sand charged with gas, the gas being shown in red. The next drawing would show the bit entered some distance into the gas sand, a pinkish tint to the lower end of the mud column, and a broad grin on the faces of the little devils. The third drawing would show the bit somewhat farther into the gas sand, a distinct red cast to the column of drilling mud, which is, by this time, blowing over the top of the derrick, and the little devils from the pressure bearing zones gleefully scampering up the hole. Of course, the drawings should be supplemented with printed explanation in bold type which the men would read after the drawings attracted their attention.

II-b. Pulling drill pipe off bottom too rapidly. Even when the bit is not balled up, and when the drill collars are not oversize, there is a pressure drop at the bottom of the drill stem when it is raised off bottom. This pressure drop is in proportion to the length of the drill pipe, the gel strength of the mud, and the rapidity of raising the pipe. Cannon[1] measured pressure drops of 375 psi and it is thought by Vietti and Levy[2] that the actual pressure drop is somewhat higher than measured by Cannon. A pressure drop of 300 psi is equal to the removal from the hole of 800 feet of mud weighing 9.5 pounds per gallon. Even momentary drops in pressure permit the entrance of gas into the well with the result that the mud becomes gas cut and the final effect is the same as caused by drilling a sand too fast. Here again it is doubtful that any but the best drillers have ever stopped to analyze why they have been taught not to withdraw pipe from the hole too rapidly.

In trying to bring this point home to them graphically, a poster somewhat along the same lines as the one just described might do, but another picture might be worth considering. Visualize a poster entitled "Don't Pick Up The Pipe Too Fast Or You'll Pull Hell Into The Hole," with the first drawing showing the bit on bottom and the hole full of mud holding an artist's conception of hell in check. The next drawing would show the pipe a short distance off bottom, the hole only partly filled with mud, and the inferno of gas rushing into the region of low pressure below the drill pipe, and proceeding up the hole.

II-c. Balling up the bit or drill collar by crowding in sticky formations, and *II-d. Using too large a diameter drill collar.* These two points are listed separately for the reason that they may come under the jurisdiction of more than one person. However, they may be discussed together since they are closely related as a contributory cause of blowouts. It is probably obvious to most drillers how drilling sticky formations too fast will allow the cuttings to ball up and pack around the bit and how this condition is aggravated by oversize drill collars. It also should be apparent to them how these packed cuttings make a perfect swab as the pipe is withdrawn from the hole. The danger entailed in pulling a balled up bit is so well known to most drillers that it is doubtful that it is ever done intentionally.

It is thought that a poster devoted to this topic should be designed to call attention to the fact that the bit may be balled up without the driller's knowing it. Since swabbing action is so well known and easily understood, a drawing would not be necessary to illustrate the point, but would probably be desirable as an eye-catcher. The poster might be headed "Don't Swab Until Tubing Is Set," and then point out the importance of being sure that the bit is not balled up before picking up the pipe and how this may easily be checked by stationing a helper to watch for an overflow of mud from the hole as the pipe is withdrawn.

Watch The Mud

II-e. Pulling pipe out of the hole before the mud is in proper condition. It should be easy for even inexperienced drillers to understand that even though the mud in the slush pit is in excellent condition, the mud in the hole may be in an entirely different physical state. Not only may the mud in the hole be full of cuttings, but also may be gas cut due to too fast drilling of a sand, or to swabbing action. Since the only satisfactory way of getting mud in the hole is through the drill pipe, it is obviously highly undesirable to have a well start kicking while pipe is out of the hole. Therefore, the only safe procedure is to lift off bottom and circulate a sufficient length of time to be sure that a complete cycle has been made and that the hole is full of clean, fresh mud before coming out of the hole. The length of time required to get returns from bottom, of course, varies with the size of the hole being drilled, the depth, and capacity of the slush pumps.

Since the time required for this operation is apparently often underestimated, a poster dealing with this subject should indicate the minimum length of time required under given conditions, in addition to an eye-capturing drawing pointing out the danger of coming out of the hole before sufficient pumping has been done. Leaving the exact nature of the drawing to the poster designer, the chart showing the time required to get returns from bottom should, in interest of simplicity, be devoted to the particular conditions that exist on that rig. This could be easily accomplished by leaving a blank space for the chart on the poster, but sending out with the poster several charts covering different pump sizes and hole sizes. The superintendent could then paste the proper chart on the poster before posting it.

II-f. Failure to run fill-up pump frequently while pulling pipe from hole. All workmen, no doubt, understand that drilling fluid is displaced when drill pipe is run into the hole, and conversely, the level of the mud is lowered as drill pipe is withdrawn. However, there are many of them who do not realize how much the level is lowered even in a comparatively large hole or how this condition is multiplied as the diameter of the hole decreases. One point that many of them may overlook is that the mud inside of the drill pipe should be disregarded because it usually flows out of the opening in the bit so slowly that a large part of it is lost as each stand is disconnected.

Therefore, it is thought that an excellent subject for a poster would be the data given in tabular form by Carpenter, wherein he shows that withdrawing 100 feet of 4½-inch outside diameter drill pipe from a 15-inch hole results in 10 feet reduction in mud level; whereas, withdrawing the same pipe from a 7-inch hole causes a drop of 70 feet. A poster entitled "Don't Forget To Fill Up When Coming Out Of The Hole" might illustrate a section of hole 100 feet deep and 15 inches in diameter, with the drill pipe in place and full of 10 pound mud exerting a pressure of 2 psi on bottom. Alongside this there would be a drawing of the same hole with the drill pipe removed, the mud level lowered 10 feet, and a pressure of 47 psi showing on bottom. Below this would be a pair of drawings illustrating the same condition for a 7-inch diameter hole where the mud would be lowered 70 feet and the hydrostatic pressure reduced to 16 pounds.

II-g. Use of low pressure fittings in high pressure control manifolds. Anyone who has ever spent much time around a drilling rig has seen vital control lines intended for handling high pressures but containing low pressure fittings, such as cast or malleable iron, screwed end, tees and ells. Also, it is not uncommon to see high-pressure flange connections hung together with maybe three or four small square head bolts. Since the old adage about a chain only being as strong as its weakest link is so well known, it is hard to understand why even careless workmen will rig up connections, which they know to be important, with fittings which will not stand the pressure. Probably, many times they realize that the fitting is not the proper one to use in that place or that the bolts are not right for that flange, but since they can't find the proper fitting or bolts at that minute, they go ahead and install the wrong one with the idea that they will change it later, but forget to do so. This is one of the things that could be overcome by an adequate inspection plan as mentioned before. However, in addition to this, the men should be taught that it is courting trouble to use lightweight connections in high-pressure manifolds.

A poster devoted to this topic might be headed "Don't Send A Boy To Do A Man's Work." It might show a fanciful drawing of a manifold made up of big, robust fittings obviously having no trouble holding the pressure in control, but containing a scrawny little fitting which is obviously sweating and straining and on the verge of giving up.

II-h. Procrastination in making rig repairs. Human nature being what it is, people are inclined to put things off. Therefore, it is not too surprising to often find control equipment that needs repair, such as new packing in a blowout preventer, and even though the drilling crew is aware of this need, they just have not gotten around to doing it. It probably doesn't occur to the men, but it is nonetheless true, that control equipment in bad repair is almost as bad as no control equipment at all.

Several good posters could be designed around this subject using such catch phrases as, "A stitch in time saves nine," "Do it NOW," etc.

II-i. Continuing to drill or circulate during a heavy rain. Heavy rains present an ever present hazard for they will soon thin and lighten the drilling mud to the danger point. The safest procedure is to shut down the pumps and pull the

OTIS PRESSURE CONTROL SERVICE – EQUIPMENT

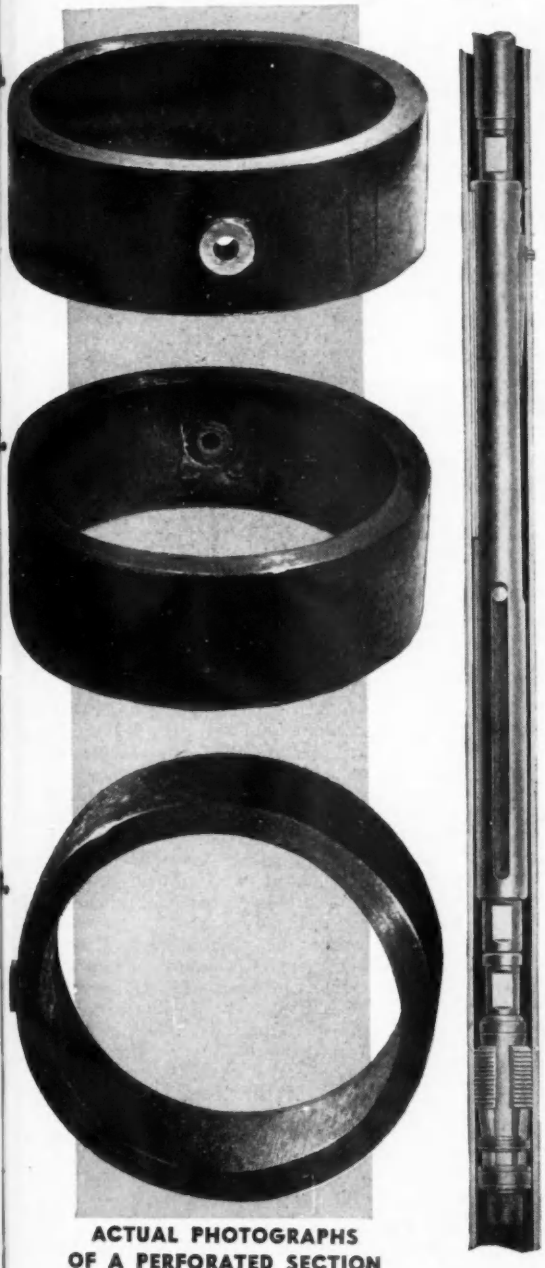
Sub-Surface Facts

ON THE CONTROL OF FLOWING WELLS

OTIS PRESSURE CONTROL SERVICE – EQUIPMENT

No. 13 1944 DALLAS, TEXAS

TUBING PERFORATOR SIMPLIFIES GAS LIFT INSTALLATIONS



ACTUAL PHOTOGRAPHS OF A PERFORATED SECTION

1. Straight-on outside view of tubing shows tapered cylindrical insert in place. Note lack of distortion and the perfect fit of insert within the clean-cut hole.

2. Insert is driven 1/32" beyond inside diameter of tubing. This lets inside perimeter of the hole through tubing wall shrink or contract and lock insert securely in place.

3. This view illustrates the perfect round and full opening maintained in the tubing. There are no shoulders or restrictions to prevent swabbing or running of bottom hole pressure gauges, paraffin scrapers or other sub-surface tools.

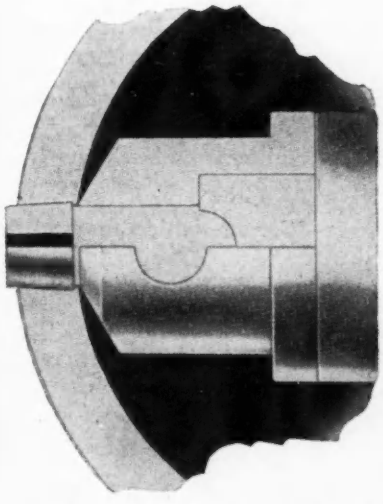
ORIFICES OF ANY SIZE PLACED IN TUBING WALLS AT DESIRED DEPTHS WITHOUT MOVING TUBING OR KILLING WELL.

Equipping a well for gas lift now requires only a few hours' time. No longer is it necessary to pull the tubing to install jet collars or flow valves. Instead, the Otis Tubing Perforator is used to drive inserts containing orifices of a desired size through the tubing walls and to securely lock them in place. The complete operation is done under pressure on an ordinary steel measuring line in much the same manner as a bottom hole choke is run and set.

PERFORATOR MECHANICALLY OPERATED — NO EXPLOSIVES

Operated on an ordinary steel measuring line, the *New Otis Perforator* is basically of the same design as used successfully by *Otis* for the past several years. It is mechanical in operation—no explosives are used. Perforations can be made at any depth in the tubing string.

With the use of tubing jars, a small, hardened steel insert containing an orifice is driven through the tubing walls. The size of the orifices ranges from $\frac{1}{32}$" to $\frac{5}{32}$" in diameter. If a greater capacity is desired than will pass the largest insert, more than one may be used, or the insert can be eliminated altogether and an orifice of sufficient size punched directly through the tubing.



INSERT SECURELY LOCKED IN PLACE

The orifice insert is slightly tapered so that the hole punched into the tubing is expanded as the insert is driven to its ultimate position, which is $\frac{1}{32}$" beyond the inside diameter of the tubing. This permits the inside perimeter of the hole punched in the tubing to shrink back of the insert, locking it against backward movement. The taper, of course, prevents forward movement of the insert. So securely is the insert locked in place that 5000 p.s.i. pressure differential across the insert in either direction will not force it from its seat or cause it to leak.

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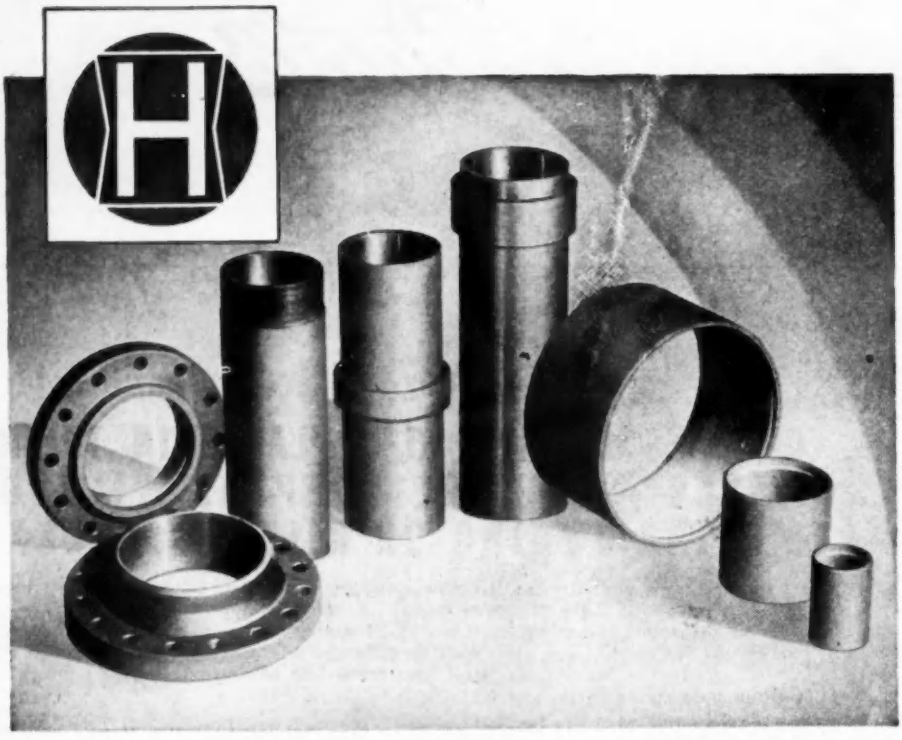

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pipe up into the casing or out of the hole when a really heavy rain-storm occurs or threatens. However, this cannot always be done and, since even a light rain may do more harm to the mud than may be imagined, the men should be schooled in paying particular attention to the condition of the mud during bad weather so that addition of weighting material or similar steps may be taken before it is too late.

To illustrate the point, a poster entitled, "Drilling Mud Hates Rain," would show the cross section of well bore and derrick with the sun shining and the heavy drilling mud (indicated by a dark color) holding the little gas devils in check. The next picture would show the rain coming down, the mud diluted (as indicated by a lighter color), and the little gas devils entering the well bore. Printed matter below these drawings would give specific instructions to be followed during a rain storm.

II-j. Failure to maintain the reserve mud supply in condition for use. The importance of an adequate reserve supply of drilling mud for use in an emergency has been discussed. However, drilling mud in the reserve pits is of little value if it is not in condition for almost instant use. This is a fact which is often overlooked by the drilling crews and, as mud lying idle usually deteriorates rather rapidly, it is often found that the reserve mud cannot be used when it becomes necessary to call it into service.

A poster which might aid in keeping this matter under the attention of the workmen might show a picture of a mud pit which is dried out and cracked open due to evaporation and could be entitled "Don't Forget About Your Reserve Mud Supply." Below the picture there should be a brief statement as to the importance of reserve mud with suggestions for keeing it in the proper condition for use.

II-k. Lack of general vigilance for the unmistakable signs of gas. Although one often hears statements to the contrary, it is doubtful that any well ever blows out entirely without warning. Often a blowout may be attributed to abnormal pressures for the reason that the mud had been checked immediately prior to the blowout and found to be in proper condition. However, when the trouble is later overcome, the pressures are found to be normal and, therefore, the mud in the hole must not have been in proper condition. If all the facts could be learned, there would probably be ample evidence before the blowout started that troube might be expected. Experienced and careful workmen are familiar with the unmistakable signs such as the pump speeding up, the mud level in the pit rising or falling, a back flow through the drill pipe when making connections, etc., which give warning of impending trouble.

However, there are probably many workmen in the field today who would probably not even notice these occurrences and, if they did, would not realize their significance. Therefore, it seems that a whole series of posters might be devoted to this topic, each poster treating with one of the advance notices that blowouts usually give, and pointing out that it pays to believe in signs.

II-l. Failure to obey specific instructoins. Replies to the questionnaire indicate

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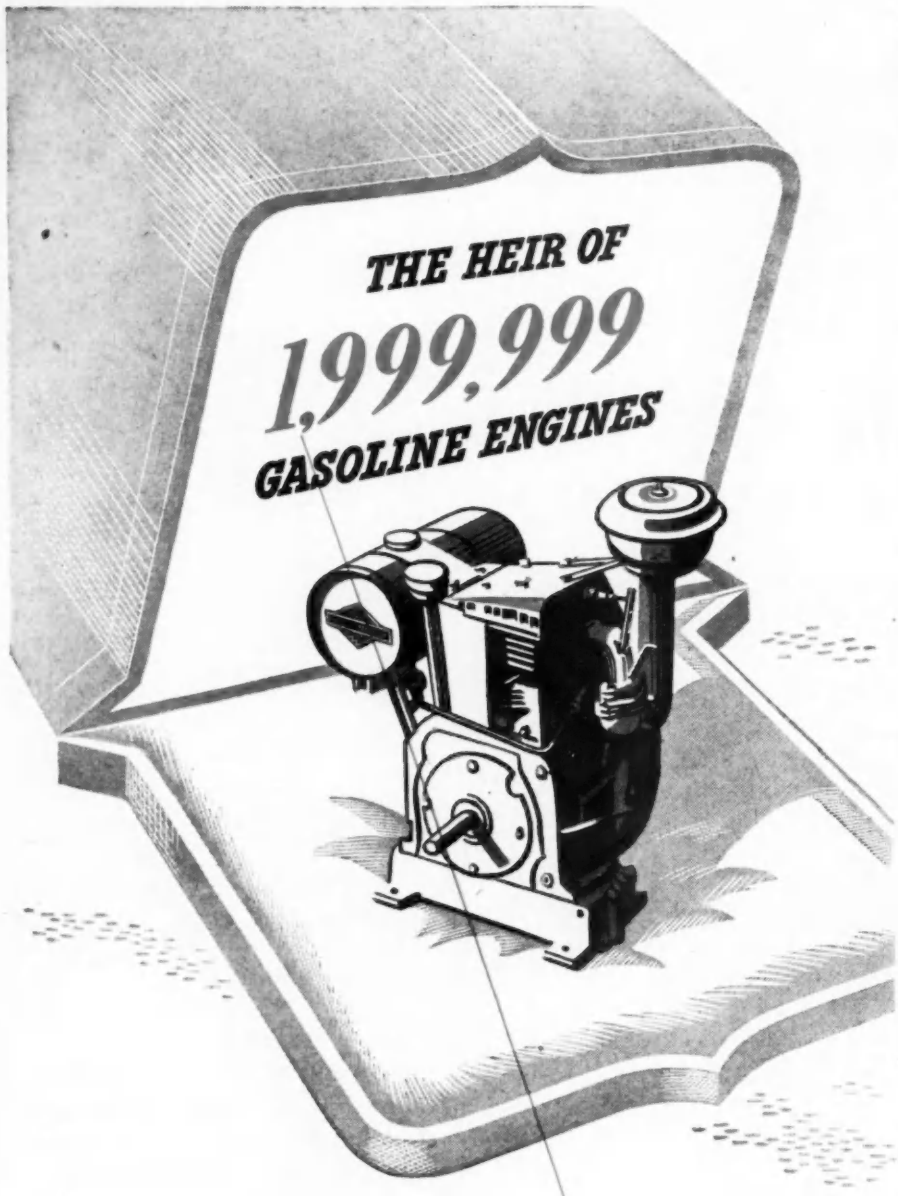

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that several recent blowouts may be largely blamed on the fact that the men did not follow specific instructions. The reason for not having followed instructions is not clear, but regardless of whether it was due to carelessness, negligence, or to the driller thinking he was smarter than the man giving the instruction, it appears that it should be reimpressed on the men that when specific instructions are issued there is a valid reason for them, and that they should be followed if it is at all possible to do so. Of course, if a man insists on disobeying instructions, he can always be disposed of. However, this seems to be a negative attack as the damage already will have been done.

Since it is well known that men are more inclined to coopearte in following instructions when they know the reason behind the instructions, it is thought that the general educational program which has been suggested above will be beneficial from this standpoint alone. However, some further good might be accomplished by a series of posters devoted to such subjects as "Pay Attention," "Don't Let Instructions Go In One Ear And Out The Other," "If You Don't Understand Instructions, Don't Be Afraid To Ask Questions," etc.

The author has given considerable emphasis to an educational program through the medium of posters, as it is thought that such a program could be set in motion without much delay and is one which has been proven highly effective in other fields. However, an educational program should not be restricted to this one medium but should include the conventional educational means of written texts and personal instruction. In regard to written texts, the Naval Air Forces have developed a scheme, which though rather unconventional seems to be highly effective, whereby the technical points are supplemented by cartoons showing what may happen as a result of an error in judgment or of not following instructions. In these cartoons, Dilbert, an imaginary student who does everything wrong, makes vivid with bitter humor, mistakes which might otherwise be learned only through costly experience. The preparing of a comprehensive educational program will entail considerable effort; however, there is little question but that the dividends will be out of all proportion to the time and labor expended.

Prevention of blowouts lies in the hands of the operators and their personnel. The combination of blowout-conscious management, good equipment, proper drilling mud, and well-educated and well-trained drilling crews is the best blowout prevention insurance available.

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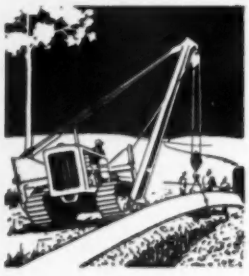
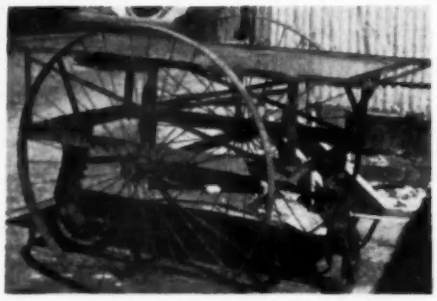


OPERATING HINTS *For Pipeliners*

High-Wheeled Cart Speeds Overhaul Parts Assembly



Salvaged wheels and axle from extinguisher mount this handy collector tray for small parts.

Handling of small parts when working over pumps or power units in the station can be expedited, and the transfer to a safe and convenient location for clearing speeded up if the parts be laid out on a small cart or transfer unit at the time they are detached from the unit under repair.

MATERIALS HANDLING

One such device was built from the axle and wheels of a discarded fire extinguisher, a rectangular steel frame being welded to the axle and provided with risers to carry a second such frame at convenient working height, the upper frame being covered with light tank steel to form a table of sufficient strength to carry any anticipated loads.

Heavy truck casters, carried in sockets welded to the lower rectangular frame, provide end support for the table and permit it to be pivoted in little more than half its length, enabling it to be maneuvered among pipe manifolds and brought to the job, eliminating much of the manual transfer of disassembled parts.

The space between axle and steel table may be used for the storing of short pipe lengths, and other material which cannot well be placed on the upper table. Placing a second light sheet across the axle and end members of the lower rectangle provides a second storage space for materials, this being used frequently for storing dirty parts, transfer to the supper shelf being made as the cleaning is done, so that the clean units can most readily be reached while reassembling.

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

Fume Collecting Hood Aids Metallizing Work

Where metallizing is a part of the repair and maintenance work of the station, some type of hood for removing the fumes and stray metal particles is of help in maintaining better working conditions in the remainder of the working space.

BETTERING WORK AREA

One such installation employs a rectangular box, erected directly in back of the lathe used for metallizing, the retangular space being divided by a vertical partition so that only one portion need be operated when relatively short articles are being metallized. The two sections of the box taper to individual cones below the work level, each being in turn connected by means of a sweep ell to a short ejector pipe.

At the center of the arc of the ell a stub or jet pipe is set, this being powered by steam or compressed air, depending upon which is available at the site. By operating the jet on the desired side, sufficient air flow through that section of the hood is induced to insure setting the fumes and particles in motion toward the collector, the increasing velocity of the air stream being such as to continue carrying of particles once picked up.

The exhaust from the end of the injector pipe may be blown down against a water surface, to entrap the metallic particles, or the air may be allowed to blow free in a settling box, as desired.

Insertion of a screen or interceptor of ¼-inch hardware cloth at the base of the conical section traps any large masses of blown metal, and prevents clogging of the line with materials.

Electric Outlet Lock Cuts Grinder Hazard

To prevent the unauthorized use of an electric motor powered grinder in a station building when there is a possibility of an explosive mixture through escape of gas or high-volatile crude, one pipeline company equips the current outlets for such units with locking caps which are kept over the sockets until such time as the chief engineer or other authorized supervisor has checked the premises.

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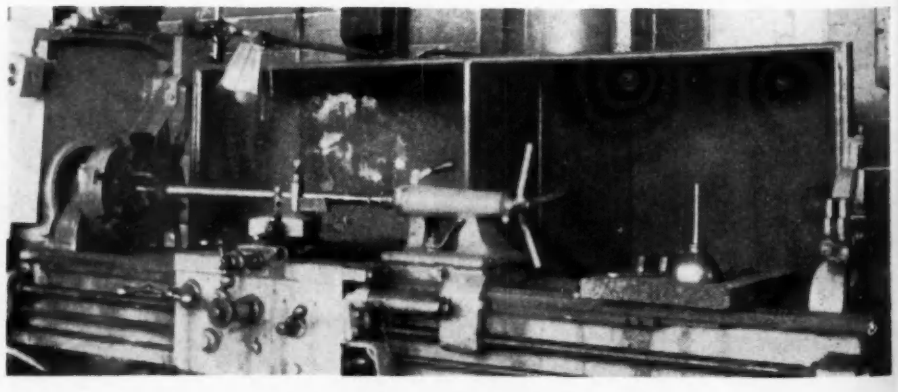
The locking devices and padlock are carried on short chains, affixed to the wiring terminal, so that the closures are always available for replacement as soon as the necessary work has been finished.

The covers, formed from any of the dielectric synthetic resins, screw tightly into the sockets, and thus provide a satisfactory dust and moisture-proof



Divided by vertical baffle, this dust and fume collecting hood is activated with air or steam jet, effectively clearing shop and permitting other work at adjacent bench.

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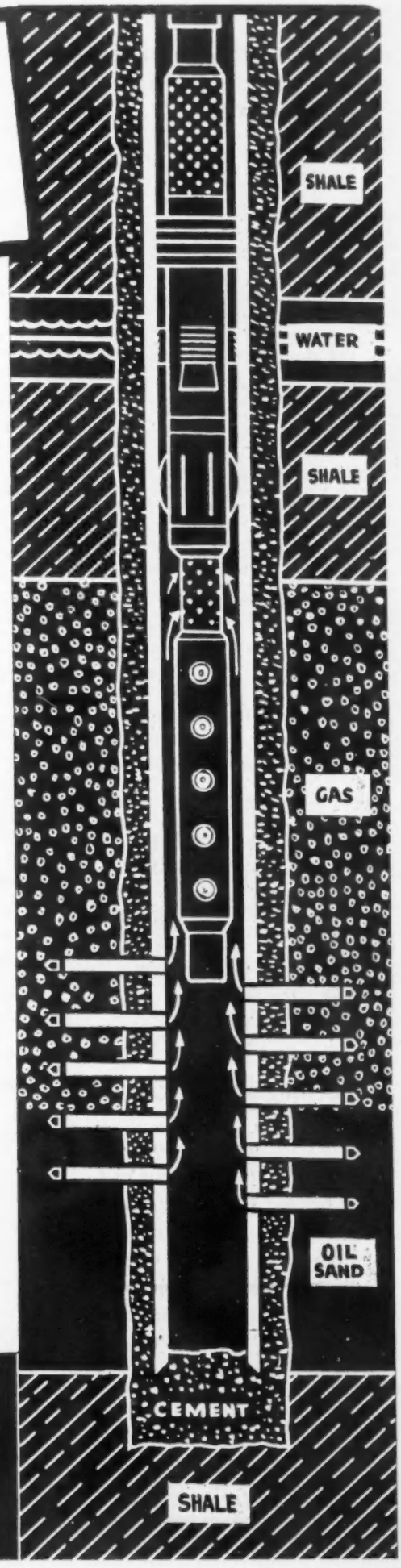

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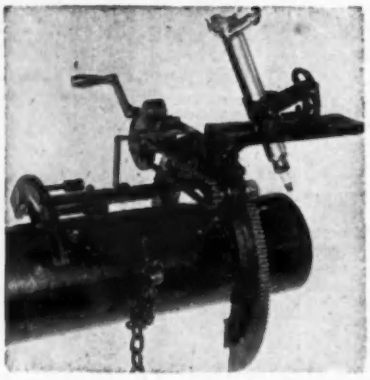

The H & M Pipe Cutting and Beveling Machine cuts any size pipe with speed, economy and accuracy.

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seal for the contacts while not in actual use.

Use of a padlock permits sealing off of the contacts by whoever is using the grinder; it being necessary only to replace the locking device through the eye of the cover and snap closed, after which the key must again be requisitioned before the grinder is again activated.

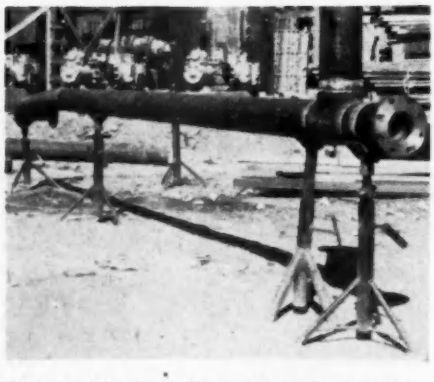
Leveling Jacks Reduce Manifold Make-Up Chore

Fabrication of manifolds, well-head tie-ins and other specially laid out pipe was formerly a job for the pipe-welding shop, which made such special work to sketch or specification; or else the work was done in the field, at the point of tie-in, with the actual junctions being largely a matter of cut and try and eventual sealing with the required beads.

WELDING HEAVY PIPE

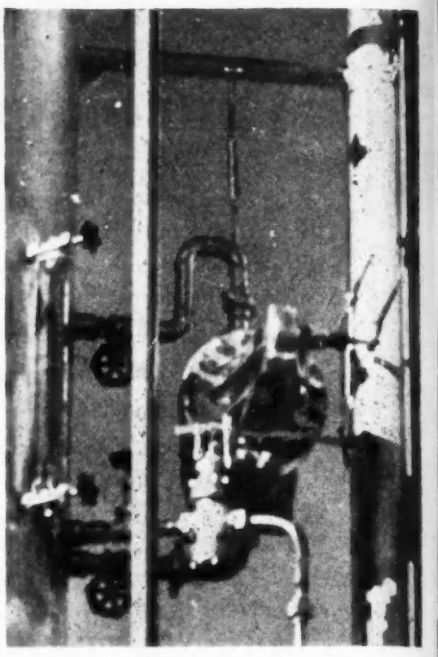
Now that most commercial welders are on war work, and reduced transportation facilities hamper work on the job, many pipe lines are doing all welding possible at the main station shop.

For such pipe work, involving branches, offsets and abrupt changes of direction, one shop provides a set of welding jacks, formed from sections of heavy pipe, tapped inside to take a threaded stub, and provided with tripods which do not require leveling to stand firmly. The upper end of each screw is fitted with shallow U-shaped section, socketed to allow the screw to turn within the support and thus permit the pipe lying therein to be adjusted to desired angle and slope to adjacent sections.



Tripods with adjustable saddles allow pre-alignment of components of intricate pipe assemblies.

Turnbuckle and Bracket Improve Instrument Mount



Relieving pipe connections of instrument weight extends life of set-up and aids regulation.

When a liquid level controller must be mounted outside a tank or other vessel, the weight of the unit transfers strain to the threads of the pipe nipples carrying the load, and is apt to cause leakage or even breakage of the pipe through the reduced area at the thread root. Vibration, as well as wind-pressure may also add to the stresses set up by the weight of the unit, thus increasing the possibility of leakage.

CARING FOR EQUIPMENT

One company carries a bracket from the tank to a nearby flow line some foot or more above the top of the controller, supporting the bulk of the regulating unit from this support through a rod and turnbuckle, so that the unit may be accurately aligned with the piping connections and the unions then used merely to seal the line junctions.

Use of the outside support also speeds removal or servicing of the unit when it must be detached from the tank or pressure vessel, and eliminates the accident hazard present when the fluid lines to be broken also constitute the support of the unit.

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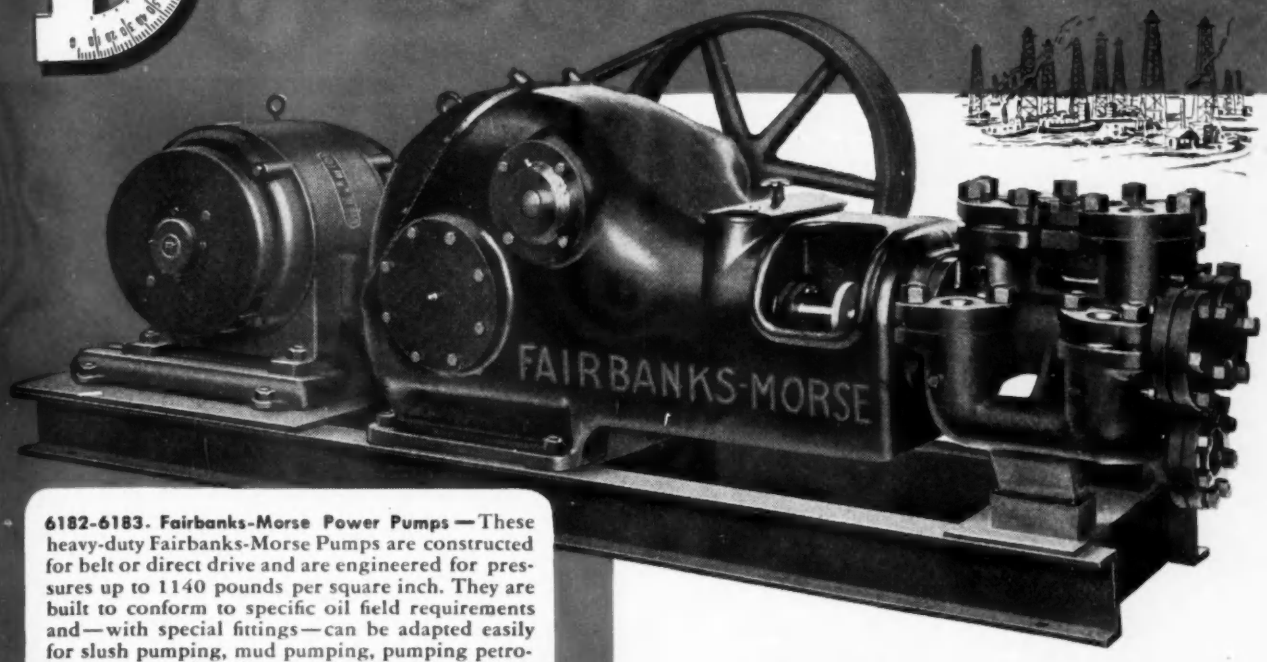

6182-6183. Fairbanks-Morse Power Pumps — These heavy-duty Fairbanks-Morse Pumps are constructed for belt or direct drive and are engineered for pressures up to 1140 pounds per square inch. They are built to conform to specific oil field requirements and—with special fittings—can be adapted easily for slush pumping, mud pumping, pumping petroleum products, handling liquids of moderately high temperatures, or a great variety of other special applications.

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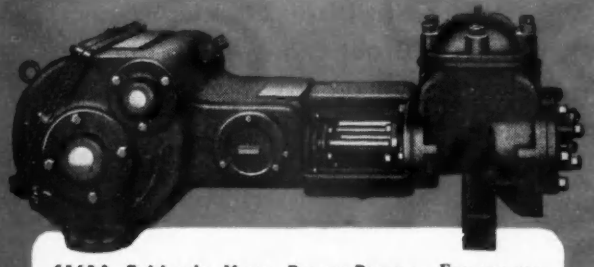

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For further information about Fairbanks-Morse Power Pumps—and the complete line of other equipment designed for specific oil field duty—write for the new Fairbanks-Morse catalog of Oil Field Equipment. Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago 5, Illinois.

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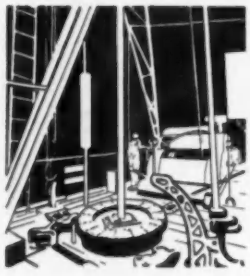
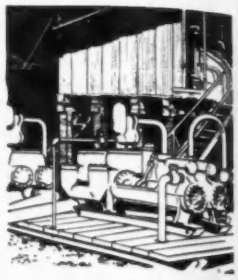


OPERATING HINTS *For Drilling Crews*



Portable Pump Transfers Mud Accumulations

When drilling a well in an area where debris, mud and other waste materials from the operation must be kept to a minimum, or even removed as formed, a separately driven pump is effective for transfering waste from the small pit used for temporary collection to the truck or other transportation used for disposal.

LEASE CARE

The gasoline-engine driven centrifugal pump used for this purpose by one company is mounted on an automobile front axle for road transportation, with a supplementary pair of iron wheels inserted under the engine end of the unit to give stable support.

The tongue for hauling the unit is so fixed as to put all the load on the rubber tired wheels when on the road, being jointed so that it may be used as support for the curved discharge pipe, holding this unit in position for discharge over the top of the tank or vat on the disposal truck.

The unit may be set up adjacent to the pit, with suction hose reaching the lowest spot of the accumupation sump, and with the unit so faced as to permit ready access with the disposal truck.

The pump is also available for unwatering cellars, pumping out flooded pits, and other maintenance work when not set up as part of the drilling equipment on a job where frequent removal of the waste is required.

Trailer-mounted engine-driven pump unit with hose and adjustable delivery spout aid in handling mud and wastage from closely regulated townsite and agricultural lease areas.

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Emergency Sampling With Special Scoop

When expecting a change in formation, or any other occasion when a large sample of cuttings is required on short notice, one geologist utilizes a combination scoop and container which will quickly separate cuttings from the stream and provide quantity, even if not giving an accurate cross-section of material carried by the entire mud stream.

CUTTINGS CATCHER

The unit is a wide, shallow tray of tank steel, provided with one high end and one low, neither reaching to the level of the sides. Spaced across the bottom are two or more transverse baffles, some 1½ inches in height, set with slope toward the high end.

To use, this sampler is set into the mud flume, with the higher end toward the flow. The stream, striking the baffle, flows over it with a rolling action which continues across the baffles and out the lower end. This turbulence tends to throw out cuttings from the mud stream, where they quickly settle behind the baffles. In a relatively short time the device fills up nearly as high as the baffles with cuttings, the rapidity being related to drilling speed and ratio between width of the sampler and the flume.

Steel tray with baffles and one high end serves to collect cuttings rapidly when check is desired.

Two or more short spikes or spuds, welded to the ends of the unit, are forced into the planking of the flume when placing the sampler, preventing it from being shifted by the stream. A handle aids in removing it and pouring off trapped mud.

Snubber Checks Steam Blast from Mud Pump

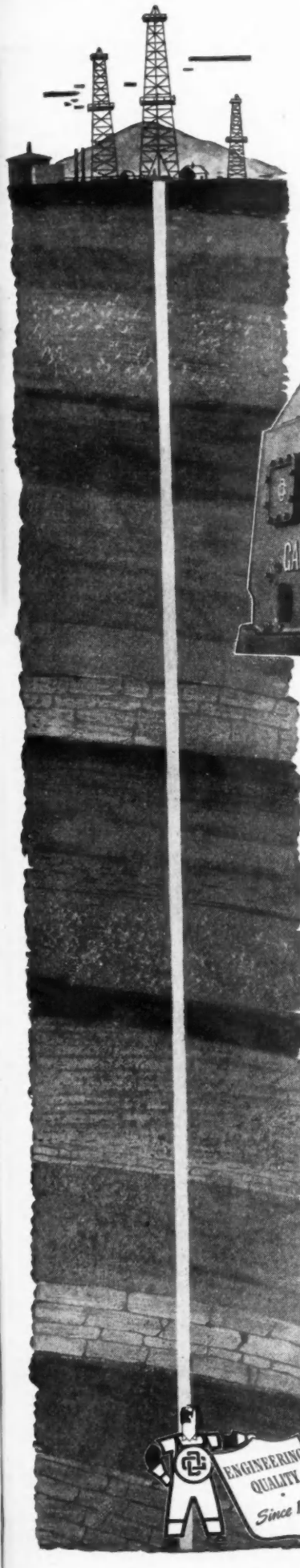
When it was possible to lay out a mud pump exhaust line only with the pipe pointing directly toward an adjacent highway, it was imperative that a snubber be installed to prevent injury or accident caused by hot water being blown onto passing traffic.

ROAD USE UPKEEP

The 4-inch exhaust line was carried in the usual manner to the edge of the fresh-water pit, for the collection of as much condensation as possible, and there the line was inserted, to a distance of some 3 feet or so, into the end of a joint of 8-inch pipe, extending across the levee of the pit.

Exhaust steam, released within the 8-inch, served to draw in cold air through the open end around the 4-inch

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas



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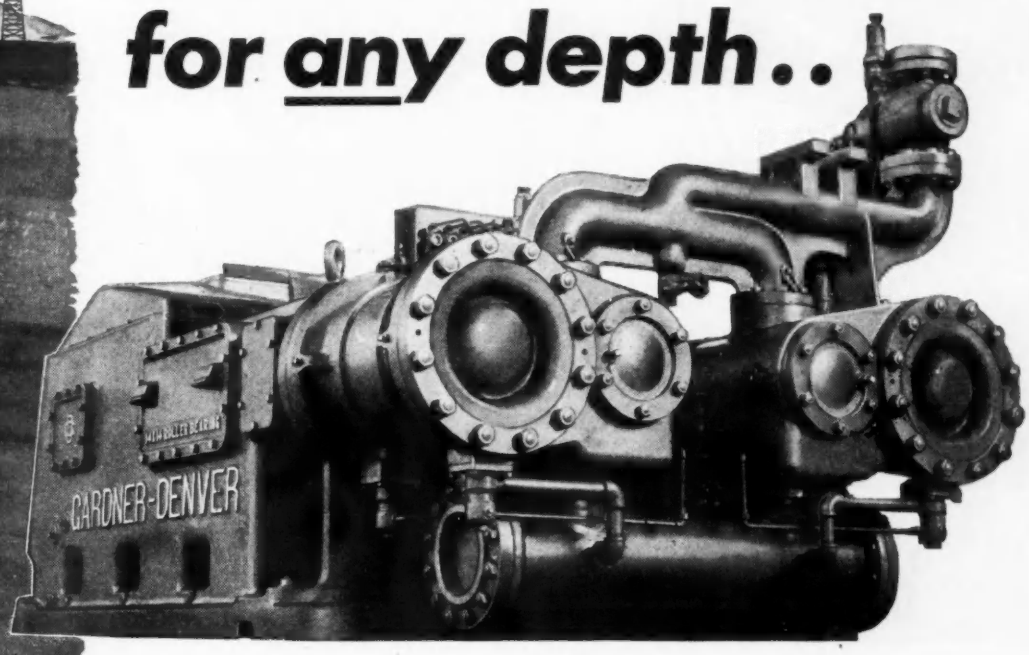

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Inserting 4-inch exhaust pipe in end of 8-inch extension reduces noise and slows emerging condensation.

line, the air and steam mixing thoroughly and giving an emerging mixture much cooler than the exhaust steam alone. From this mixture the steam condensed out as drops and fell to the surface of the pit long before crossing to the right-of-way.

Mixing the steam with air greatly reduced the velocity of the exhaust steam, and at the same time changed the stacatto beat of the mud pump exhaust to a more or less steady blow, of much less volume than the exhaust from the drawworks engine and, apparently, not objectionable to the four-footed traffic traversing the road.

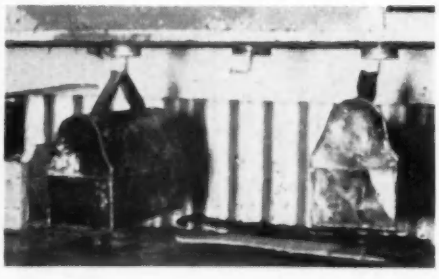
Hook Ant "Insulator" Protects Crews' Lunches

DOGHOUSE GADGET

Even though a drilling operation is usually regarded as "temporary," location of the lunch boxes of the various crews is usually determined by insect pests before completion of the spudding job. In the Gulf Coast area ants are especially bad, and it is no unusual thing for a man, or an entire shift, to find that all but the wrapping has been devoured by ants in a relatively short time after the crew reports for work.

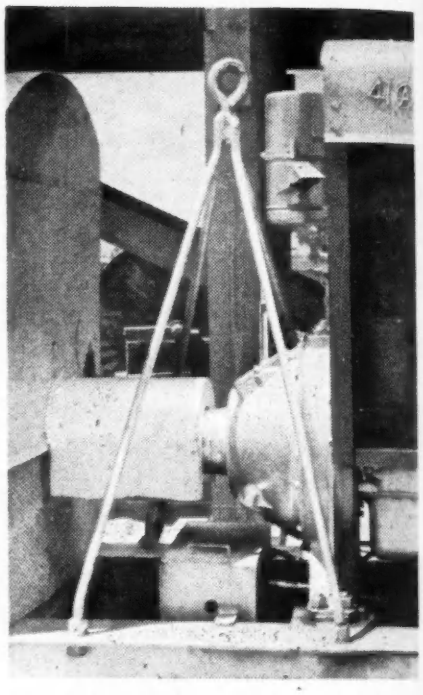
One contractor equips the under side of a shelf at the work bench with a series of hooks, one for each man on the drilling crew. These hooks, formed from heavy nails with a right angle bend some inch below the head, are also equipped with shallow cups or pans, welded, brazed or soldered to the shank of the nail, which is then driven into the bottom of the shelf to leave clearance of ½ to an inch between top of pan and board.

To protect the lunch boxes suspended on these hooks, it is necessary only to squirt a small amount of kerosene or other light oil into the cup. Any ant which gets as far as the hook shank is unable to cross the oil, and the contents of the box suspended below is safe.



Heavy nails, hook-shaped and fitted with shallow pans for oil-filling, prevent ant travel to lunch boxes.

Built-in Lifting Unit Speeds Parts Handling



Bolted through skid members at balancing point, these four rods unite to form convenient lifting bail.

EQUIPMENT TRANSFERS

Unitized equipment, such as a portable generator set, can be lifted from its setting and placed on a transport truck without damage when equipped with a substantial lifting bail for the chain hook of the service boom. The horizontal static balance of the equipment is calculated so that the lower ends of each vertical bar when passed through holes bored in the flanges of the 'I' beams, would not tilt the unit towards either end. The four bars grouped together at the top are welded to a heavy ring into which the chain hook of the boom is inserted.

The lower ends of the bars are threaded, having nuts below the 'I' beam flanges and jam nuts above to prevent misalignment. When necessary to service the equipment near the lifting apparatus, it can be removed without effort, and replaced without the necessity of rebalancing.

Railroads May Try to Keep Oil Transport Volume After War

More efficiency expected to result from attitude of fighting for business; executives studying problem

By DON L. CARROLL, Staff Writer

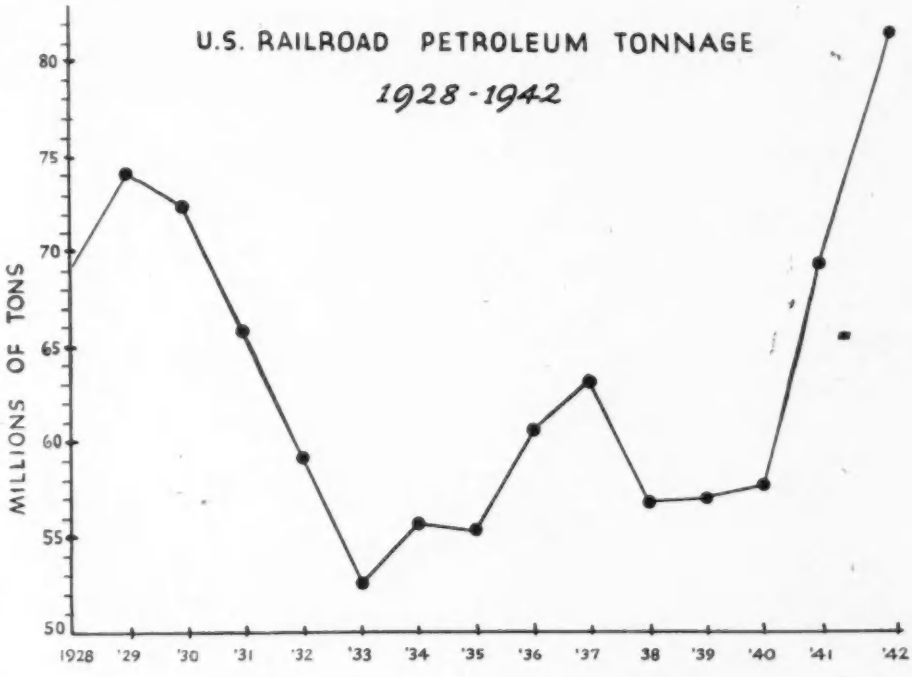
American railroads, which lost ground progressively during recent years as carriers of crude oil, in competition with tankers, trucks and pipe lines, are back in the business during the current war period on the largest scale in their history, and they do not intend to revert to their pre-war status without a fight to retain as much of this business as possible after the end of the war.

Although the methods by which railroads hope to continue their volume of petroleum and products traffic have not yet been worked out in detail, they are nevertheless being worked out on a grand scale and from the standpoint of a common industry interest. Devices and programs in the planning stage are aimed at effectively meeting competition of other carriers.

There is an unusually realistic group in charge of figuring out the details of the railroads' problem and its solution, for the whole study is based on the careful and complete analysis of postwar conditions, so far as they are predictable. These conditions involve all phases of all the industries involved in the general picture, as well as all possible contingencies regarding the operation and ownership of pipe lines, tankers, plants and other facilities now partially or wholly owned by the government.

The picture is complicated and subject to a variety of interpretations. Different groups, with different viewpoints and objectives are bound to advocate different policies and procedures, but the case for the railroads is here presented for what it is worth to the reader, and is based on factual data for the most part.

Assuming that normal competitive practices will prevail in the postwar period, it is obvious that all carriers will have to do business on bases of service, dependability, efficiency and price. Safety of cargos will be another consideration that will be emphasized to a greater extent than heretofore.

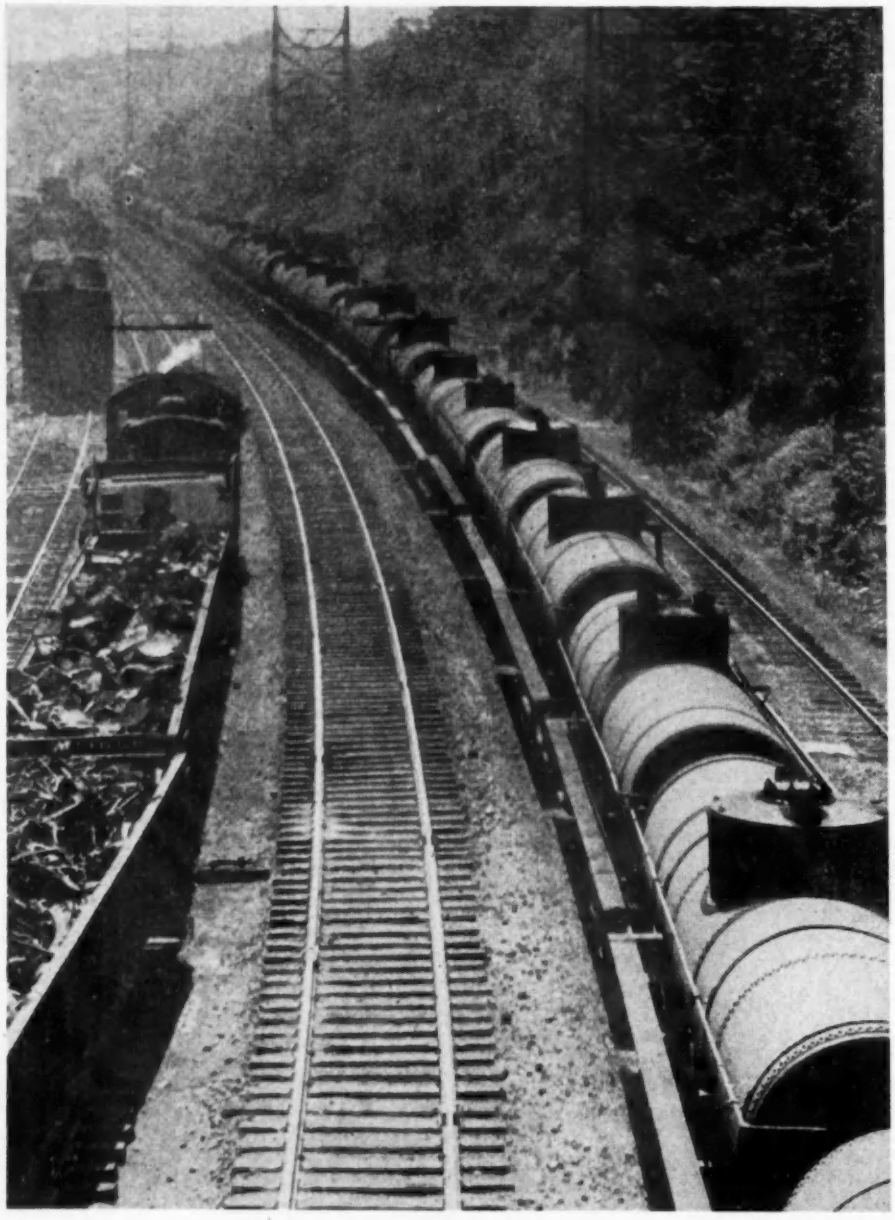


According to the Railway Business Association, comparative pre-war costs per ton-mile for the transportation of crude oil were 8.3 mills by rail, 1.2 mills to 3.2 mills by pipe line, 1.2 mills by tank vessels, and from 1.5 to 5 mills by motor truck—according to length of haul. In the face of these figures it would appear that the railroads are at a distinct disadvantage from a competitive standpoint, and must therefore reduce their costs or rates greatly in order to hold their own when the war emergency is ended.

It seems evident that much can be done by the railroads in this direction, and that they will be much more efficient as a result of their new "fight-for-business" attitude. Their war experience has demonstrated how much can be accomplished by reducing turn-around time to a minimum, by keeping tank cars on the go with a minimum of empty haulage; by speeding up unloading and loading time, better scheduling, etc. It has also demonstrated that it is uneconomical to drag 4,000-gallon cars all over the country when 16,000-gallon cars are available or can be built. Hauling more at less cost is thus shown to be entirely possible.

In the past, the railroads have stuck to their guns in regard to fixing cost and rate charges. Their inflexible attitude, on a "take-it-or-leave-it" basis has no doubt been largely responsible for their loss of oil traffic, and has made possible, or actually forced, the construction of pipe line system and the rapid growth of tanker and truck fleets. The railroads are, of course, now awake to the folly of such policies, and will probably never revert to them in the future.

In this connection, an apt statement



Day or night, this is a common scene at many refineries in the United States during the past 18 months. Seemingly endless strings of empty tank cars arrive, are filled, and are shuttled out again in a ceaseless campaign to speed essential petroleum war goods to points where they are needed.

was recently made by Sidney A. Swensrud, vice president of Standard Oil Company of Ohio, who is also a member of the Petroleum Industry War Council. He said that in figuring the cost of doing business by their own peculiar methods of accounting, the railroads were entirely overlooking the cost of losing the business by such methods.

The railroads possess one advantage in that they serve many more distributing points than any other transportation medium, unless motor trucks are used for coast-to-coast deliveries, a doubtful possibility. Another advantage is their ability to handle any type of crude or product on a single train, with cars especially designed for each specific use. Drums, cans and cylinders are handled in freight cars. Gasoline and naphtha are carried in specially insulated tank cars. Tank cars equipped with heating coils permit waxes and asphalts being pumped out at destinations. Special tank cars are also in use for transporting natural gasoline and liquefied petroleum gases.

The railroads are well aware of their potentialities for continued high-volume transportation of petroleum. This awareness is an outgrowth of their experience in alleviating the wartime shortage on the East Coast, and in licking the problem quickly and effectively. Many traditions and complicated practices were thrown overboard in response to war emergency demands. The lessons have been well learned—so well learned that it is doubtful whether the railroads will ever again be operated in the rut of obsolescence or will nurture themselves on their accomplishments of the pioneer era. Railroad management has at last acquired a streamlined attitude and incentive. Competing carriers will face tougher competition from them in the future.

According to P. Harvey Middleton, executive vice president of the Railway Business Association, the railroads voluntarily granted substantial reductions in freight rates on oil hauled to the East Coast, as of September 15, 1941, with approval of the Interstate Commerce Commission. The reductions ranged from 25 to 50 percent, depending upon type and value of commodity and distances involved. This business was profitable in spite of the reductions, because of volumes handled and greater efficiency of operation.

Middleton cites the major importance of great expansion of pipe line capacity and mileage, and . . . "The destruction and leasing of tank vessels has resulted in the building of a new tanker fleet, speedier and more efficient than the old, and with a tonnage that is now greater than in the pre-war period. There has also been a wider use of the tank truck."

He believes that the Big-Inch pipe line may challenge the peacetime economics of the tanker traffic, because a crude oil pipe line of such large diameter and length is a new development. The reason why such large arteries have not been built in the past, he argues, is that no one company on the Atlantic Seaboard had ever run enough crude oil to enable it, by itself, to accumulate the volume necessary to make efficient use of a line large enough to compete with tank vessels.

The railroad industry is asking itself some very pertinent questions, thus revealing the direction of its plans. Will the railroads be ready and able to handle continued large volume of petroleum and products after the war? Will they be able to do so at low cost? Will they make a determined effort to reduce rates to a point where they are in line with charges for competing services?

These questions cannot be answered categorically in the affirmative at the present time; but the fact that the railroads are hoping to announce new policies along such lines indicates that something constructive is being done to improve their position. The most significant point is that they are operating on a more or less similar basis now. They are planning to continue according to the same blueprints after the war, holding most of their wartime petroleum traffic volume and even increasing it if possible. The ensuing clash of interests promises to make industrial history, and the petroleum industry and the public are bound to benefit from the fight for oil haulage business.

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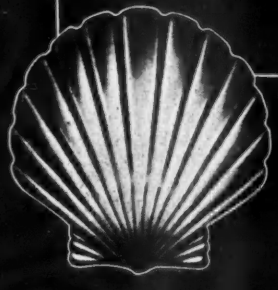

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Aim of Public Land Policy Hampered By Rigid Oil Development Rules

Conservation called real purpose of Department of Interior procedures but inflexible federal restrictions and regulations governing drilling and production cause wildcatter to look elsewhere for prospects now when petroleum is badly needed

By A. R. McTEE, Staff Writer

AS THE supply of crude oil tightens daily in the United States, weakness in the national policy on leasing, exploration and development of public domain lands becomes impressively more apparent. Secretary of Interior, Harold Ickes, commenting on the latest Federal Act controlling leasing of public domain lands, said of the Act of 1935, "The Act of August 21, 1935 is a conservation measure. Under this act, no special inducements are offered to prospect and produce from the public lands . . . . . " Thus the policy was stated as being one of restriction, and it has certainly met the response intended for it. The feeble interest in prospecting on government-owned lands denotes the general feeling among operators that the chances for coming out ahead are not worth the risk and worry of complying with government requirements.

Inflexible restrictions and severe federal regulations governing drilling and producing operations on public lands threaten to defeat the very purpose for which conservation has been established: namely a supply of oil for any emergency. At the time of most urgent need, we find a common lethargy among prospectors for drilling on government lands, a lethargy induced by the rigorous conditions that have to be met.

Lethargic Response

Interest in oil prospects on the public domain is definitely lagging. In spite of vast acreage held by the government where oil and gas are known to be present, there is no widespread interest in these areas. Wildcatters are loath to risk what it takes to drill such blocks because of the stringent measures imposed on them by federal statute. Hence discovery of new reserves on the public lands is far below what it should be; oil that these lands ought to be supplying now is not available. And the government has its reserves on public land still tightly locked in its Pandora box securely tied with red tape, while trying to remedy the sluggish crude situation by subsidizing stripper wells at a yearly cost of more than $50,000,000.

Most of the public land involved in oil or gas prospecting is held by the Departments of the Interior and Agriculture. As was stated in THE OIL WEEKLY* of June 26, these two departments control 95 percent of the land owned by the government. The Department of Agriculture holds 162,752,608 acres, and the Department of the Interior, 205,085,439 acres.

Our prevailing public land policy is deeply rooted in the history of the government. It has been an evolving policy, developed as public lands have become more and more a matter for national legislation. As far as the public domain is concerned, there is yet much work to be done to arrive at a satisfactory appraisal of its mineral content. The immense task of examining and classifying extensive areas in the west was begun more than 40 years ago. As the land was withdrawn by executive order, the work was started and is still in progress. Oil and gas appraisals are being continued in seven western states.

Mineral Character

Practically all public-land legislation has made a determination of the mineral or non-mineral character of the lands affected a condition precedent to their disposal since about 1906. Mineral classifications acquired increased importance in 1920 through legislation on administration of the federal mineral-leasing laws, and of similar laws affecting Indian lands. Various types and new forms of classification became necessary under these laws before leases could be issued. Also much additional geological field work both regional and local was and is required in the hope of preventing undue delay in response to lease, permit or license application.

Any application made to the General Land Office involving the purchase or use of public land immediately raises the question of mineral character. The matter is turned over to the Geological Survey for determination, and an attempt made to answer a number of questions: If mineral land, what kind of mineral? Does its value justify retention of rights? Should the government hold the rights, and, if so, would the disposal of the surface handicap or prevent future recovery of the mineral values?

Out of such reasoning the laws and regulations affecting leasing and development have arisen. Secretary Ickes defined the Act of 1935 as strictly a measure of conservation offering no special incentives for prospecting or development of the public lands. The same theory can be said to apply to most of the public-land legislation regarding leasing.

No one will deny that conservation of all natural resources is an obligation of a government to its people. Legislation is a legitimate activity in this connection. No more vital function can be undertaken by a government than the prevention of waste of the bounties of nature. It must be admitted that waste to a shameful degree has accompanied development of some of our minerals including oil and gas. Nothing should be left undone to prevent such practices in the future.

However, recent tendencies in government restrictions and in legislation affecting oil and gas rights particularly, are, in the opinion of many students of the situation, unduly hampering development, almost precluding it, in fact. This trend, it is believed, violates the fundamental concepts of conservation. Much recent legislation veers too much toward putting the government in the mineral business in competition with private industry. On public lands, restrictions and regulations are of such nature, that when minerals are discovered, their development can hardly be carried on with normal profit under government rules.

At the April meeting of the Interstate Oil Compact Commission, figures were cited to show how the public-land policy is holding down operations for oil and gas in the Rocky Mountain States, potentially one of the nation's most important reserve areas. In that report it was shown that the total possible oil area of the United States is about 887,000 square miles. Of this area, approximately 11 percent is in Wyoming, with 47 percent in the four states including Wyoming, Montana, Colorado and New Mexico.

Oil Possibilities

Nearly one half the possible oil territory in these states is public land. In fact, "there are very few of the oil fields within these four states without a part of the surface being covered by public lands." Wildcat activity on these public lands between January 1, 1936, and July 1, 1943, according to the report, resulted in only 37 wells being started, distributed as follows: Colorado 4; Montana 3; Wyoming 26; Utah 4. No figures were included for New Mexico. During the same period, it is shown that there were at least 21,000 wildcat wells drilled in the United States. Two percent of the total national crude production was from Wyoming during that period. Accordingly, the public lands of Wyoming should have had 420 wildcat wells, as against 26. On the basis of possible area, 500 wildcat wells should have been drilled in Wyoming.

In general the total footage and average total depths drilled in wildcat tests in the fields of the Rocky Mountain States during 1943, were below the same type of activity in other districts, as shown by the January 31, 1944, issue of THE OIL WEEKLY.

Oil and gas royalties from the public lands up to July 1, 1942, also as cited by the report, amounted to only $127,830,023.35, or at the rate of about a

* This previous article entitled "Government Acquisition of Large Land Tracts Cause of Concern" by Mr. McTee dealt with the Department of Agriculture.

million dollars a year. Of this amount only $360,128.28 was for royalties on wildcat leases issued under the regulations in force from 1935 to July 1, 1942, about $50,000 per year.

Estimate of Reserves

A representative from the Department of the Interior, appearing recently before the House appropriations committee in justification of the budget for the oil and gas leasing division of the department, testified that the known, estimated recoverable reserves underlying public land and Indian land are set at 1,310,000,000 barrels, or 24 percent of the estimated recoverable petroleum reserves in the fields and states where supervised lands are located, and about 6.5 percent of the entire reserves of the entire United States.

Thus it would seem as has been urged by the Interstate Compact Commission that "If we look the world over, there is no area more likely to produce *speedily* and *satisfactorily* more petroleum than our public lands. We have available good geologic prospects, trained manpower, supplies, and the spirit of the wildcatter, not overlooking the willingness of oil companies of the nation to supply funds as a patriotic duty" for exploration.

The sliding scale of royalty payments is among the most serious objections to government requirements on oil lands. Royalty ranging from 12½ percent on wells producing not over 50 barrels, to 32 percent on wells producing over 2000 barrels is "excessive" from any viewpoint, in the minds of oil men. The industry universally opposes this arrangement. A government royalty higher than the average for the states is without logical foundation, it is claimed. Throughout the Mid-Continent, as well as other oil sections of the country, one-eighth is the commonly accepted royalty.

The sliding scale average, it has been argued by government representatives, is about 15 percent, not including the 5 percent royalty leases. This fact is not realized by the average wildcatter, however, and it is contended that the government would lose little in reducing the royalty to the universal standard of one eighth; and it is believed that exploration activities would thereby be stimulated on public lands. Carl A. Hatch, United States senator from New Mexico, stated before the recent Compact meeting in Denver, Colorado, that "The federal government should require oil operators to pay a definite royalty, and it should abandon the sliding scale plan." "I have attempted," he explained, "to get the Department of the Interior to abandon this plan. It was this effort which led to the act providing for fixed royalties for the duration of the war. This act should be made permanent."

Interior Leasing Policy

Another obstruction to exploration on public lands, as important as the sliding-scale royalty, is the leasing policy of the Department of the Interior. The lease form itself departs radically from the "Producers 88" form which is standard in most states. At a conference held in Denver last November, there was general concurrence that the government form deters development. "The government insists on a form of lease which in effect compels the operator to obey in every detail the orders of some federal agent," says the Compact Commission report of April. "Beyond question," it continues, "a drastic lease form discourages development."

Confusion has also arisen because of dissimilar policies on leasing by the Department of the Interior and the Secretary of the Department of Agriculture. Representatives James F. O'Connor, of Montana, introduced a bill into the House, on June 1, that would place the leasing of government-owned lands exclusively in the hands of the Interior Department.

"Much confusion has arisen because of the two standards and requirements for obtaining oil leases on these lands," O'Connor said. "The Secretary of Agriculture on the one hand will lease any of these lands for oil and gas after advertising for bids and then lease only to the highest and best bidder. The Secretary of the Interior, on the other hand, leases unimproved oil or gas lands without competitive bidding to the first qualified applicant. Thus it is very easy to see that the procedure of the Secretary of Agriculture in leasing to the highest bidder gives large and powerful oil companies and individuals a virtual monopoly of the development of these lands for the oil and gas they contain. The policy of the Department of Agriculture will not only discourage exploration of the lands but will prevent development."

Hold for Profit?

Senator Hatch, in commenting on the leasing policy of the Department of the Interior, touched on the growing view in government that public lands are to be held for the profit of the federal government. "This," he said, "has not been the policy in the past.—The purpose of the old agricultural act was to put public lands into private hands, the hands of the people who would use them for homes. If your criticisms of the Department of the Interior are just, then the rules and regulations of that Department are in direct opposition to the intent of the law. But I do not say that your criticisms are just." A program "wherein the activities of the state and federal governments are coordinated," and in which there is mutual cooperation without encroachment in the field of either state or federal activity, by either, was recommended by the senator.

Hiram M. Dow, New Mexico representative to the Interstate Oil Compact Commission, speaking before the recent Denver meeting, expressed the belief that the Department of Interior has practically nullified the provisions of the 1920 oil leasing Act. Through its rules and regulations and decisions, the Department has "most certainly gone afield from the original intent and purposes of the act in many respects," said Dow. He explained this development to be the result possibly of the "failure of some of the public land states to enact timely, sound, conservation laws." Due to this lack of conservation effort by the states, "there came forward the idea that the federal government should control all drilling operations and the production of oil on the public lands. Consequently a competitive set of rules and regulations were put into effect and the Bureau has grown and has steadily assumed tighter control. It enforces its rules and edicts by fines, and forfeitures in accordance with the dictates of the supervisor in immediate control. This control has not lessened in states such as New Mexico, which has enacted and which is rigidly enforcing an adequate conservation law. Consequently there exists in states that have enacted conservation laws a sort of dual control over operations on public lands—federal control and state control. Wherever that situation is to be found, federal control dominates. This dual control exists, and the expenses of such control are uselessly duplicated—all to the discouragement of the operator, and notwithstanding the fact that 90 percent of the revenue from oil produced on government lands, either directly or through the reclamation fund, goes to the state."

Development Discouraged

In the near future, Congressman Fernandez of New Mexico, plans to hold public hearings on leasing procedure of the public domain.

The Department of the Interior has set up rules and regulations resulting in policies and practices that discourage development, as interpreted by a number of agencies in the oil industry. In the Compact Commission's report it was stated that "The Department has proceeded upon the theory that it must 'protect the interests of the United States,' which in practice means that the Department must be 'rough and tough' and exact every possible penny from the man who wishes to develop the public domain." Concentration of supervisory authority over development operations in Washington results in a form of remote control unfavorable to the operator. "Congressional Acts are construed almost universally in a strict and narrow sense." Centralization of all matters requiring decision in Washington, puts the small operator at great disadvantage, especially the average wildcatter.

Administration of the public land involving oil and gas by the Department of the Interior has sometimes been characterized by delays and uncertainties, with not infrequent change in policy, to the detriment of development, says the report. As an example of this, the regulation concerning the 5 percent overriding royalty is cited. The amendment has been under consideration and study for more than a year, and applications for leases in many cases have not been acted on. It is also known that some operators have held back with development programs in the Rocky Mountain district, because of difficulties in complying with Department requirements.

Changes Suggested

The remedy to these problems as summarized by the Interstate Compact Commission should begin with: a regulation that hereafter the royalty on all wells shall be the ⅛; a simplification of the lease form; control of operations on the public domain by state regulatory bodies; intensive efforts by the United States Geological Survey toward the discovery of new oil fields rather than the present work of the Survey in trying to administer all the details of operation on the public domain; machinery in the Department of the Interior to prevent delays; a declaration by the Secretary of the Interior of the policy that "every possible aid and encouragement is to be given to the development of the public domain."

Power Spool Extends Life Of Wire Line

Cleaning, lubricating, spooling and storing double longevity

The final drive, from lay shaft to sprocket welded or otherwise permanently affixed to one end of the reel spindle. The chain is shown in the slacked position, where it may be lifted from the driving sprocket without dismantling a link. Elevation of the spindle and reel with a pair of jacks allows pinning of the matched standards and sockets so required tension may be placed on chain drive to insure proper drive.

PROPER reeling of wire lines between periods of use will extend their service life materially. Powered storage units or reels will provide more uniform spooling than hand reeling, will permit the incorporation of wire-brush stands between job and reel, and also insure more uniform lubrication by giving steady feed through brushes or oil bath. Now that lines are hard to procure this extra life is more important than before the war. An additional wartime advantage is the time saved in spooling operations, thus permitting crews to perform other lease duties.

One such unit employs as power source, a salvaged four-cylinder automobile engine mounted transversely across the welded pipe skid in position where the starting crank overhangs the base and affords proper clearance for starting. The transmission, intact with the power unit, is retained to give selection of winding speeds, the propellor shaft with one universal being retained as in the original setup. A pair of sleeve bearings carry this shaft to its extension beyond the skid line, where a chain sprocket is fixed, the paired bearings serving to absorb the side pull of the drive and relieve the universal joint of all save driving torque.

As close to the power unit as convenient a second transverse shaft is mounted, paralleling the stub of the propellor shaft retained in the redesigned unit. A large sprocket, keyed to this lay shaft in line with the drive sprocket, cuts the initial or engine speed to about one fourth that of the transmission universal joint speed. The gear box gives the basic speed change, together with reverse which is used only when the line fouls or slack is required.

The end of the lay or jack shaft opposite to the first chain reduction drive carries a second small sprocket, carrying chain which drives the real shaft through a second large diameter unit, so as to attain desired speed reduction with maximum engine power.

By laying out the unit so that both chain reductions are maximum for allowable working clearances, the full engine speed can be used with the transmission gear in "high" without overloading the engine on most reeling jobs, while the lower gears afford ample power for clearing the line or handling it at desired slow speeds through a lubricating bath and the accompanying paired wire brushes.

Sufficient shift of the center distances between lay shaft and reel spindle is obtained by varying the height of the reel in the adjustable supports. When the reel rests on the platform supporting the skid, the chain is slacked to the point where it may be lifted free of the driving sprocket, and dismantling of any chain link is thus avoided. By hoisting the reel and shaft, the chain may be tightened to remove slack which, otherwise, might result in throwing the drive or stacking the links on the sprocket.

Babbitt bearings, of the split shell type, are used on both lay and spindle shafts, the intermediate unit being fitted carefully to enable the shaft to be aligned and vibration eliminated. Bearing metal is necessary only in the lower halves of the spindle supports, the cap serving only as safeguard against possible accidental displacement of the reel while running at relatively high speed.

Mounting of an automobile brake drum on the intermediate or initial drive shaft, with a simple toggle and lever to actuate the brake shoes, provides close control of the reel while feeding off line for drawworks or sandline reel use.

Carried through a bearing mounted in the end of the sawed-off car frame, the shortened propeller shaft of this automobile drive unit mounts a sprocket which drives the first step reduction in the powering of this field wire line reeling unit. Integral mounting of power unit, lay shaft and matched reel spindle supports on single skid insure continued alignment of all parts, and maximum power output with minimum wear on sprockets, chains and shafts.

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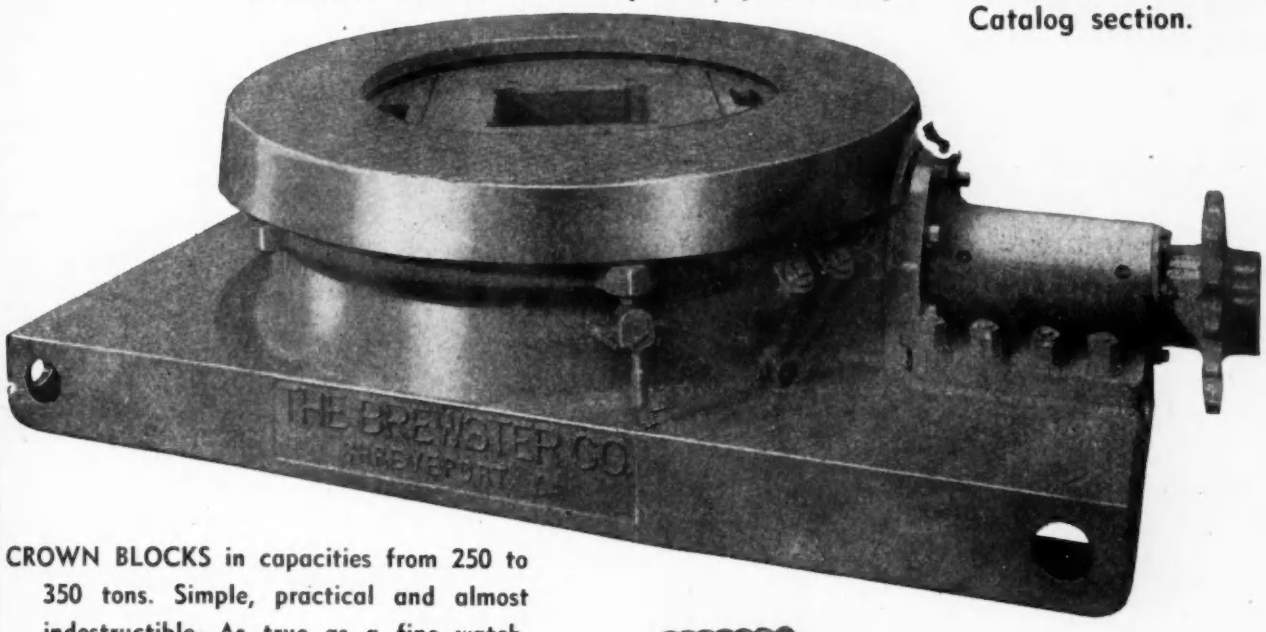

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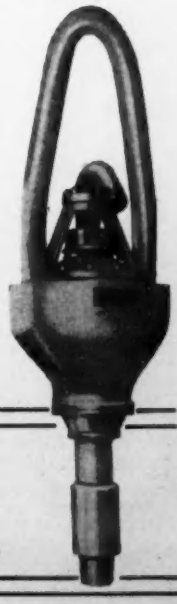


The BREWSTER Co., Inc.
SHREVEPORT, LOUISIANA, U.S.A.

FOR EXPORT: Acme Well Supply Co., 19 Rector St., New York City

Markets • Statistics • Prices

Crude Oil Stocks Down, Runs and Refined Stocks Up

Peak demands, forcing increased runs to stills, continue to cause drafts on crude oil stocks, even with current production at all-time peaks, until present supply of crude in storage is the lowest in 22 years. A reduction of 472,000 barrels during the week ending July 1, brought stocks to 228,860,000 barrels, the lowest point since April of 1922, and 12,067,000 barrels less than July 3, 1943. Nevertheless the general situation shows improvement, since stocks of gasoline, gasoil, distillates, and residual fuels increased 2,430,000 barrels, or slightly more than 347,000 barrels daily.

Crude oil production during the week ending July 8 averaged 4,579,000 barrels daily, only 8,000 barrels a day less than last week's all-time peak output, and marks the first week since April 1 that production has failed to increase or hold level. However, output is still 489,000 barrels daily, or 11.9 percent more than the week ending July 10, a year ago. At the same tiime runs to stills averaged 4,645,000 barrels daily, a 7,000-barrel increase from last week, and 717,000 barrels daily more than the week ended July 10, 1943.

Increased refinery runs were reflected in increased output of gasoil, distillates and residual fuels, at the expense of gasoline which showed a 73,000-barrel daily increase, as compared with the preceding week. Reduction in demand, however, allowed a 150,000-barrel increase in gasoline storage, now standing at 83,709,000 barrels, just 7,021,000 barrels more than a year ago. Last week stocks of this commodity were lower than at any time since January 29 of this year, there having been a continuous drain on stocks since April 1 despite continuous increases in gasoline production.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gasoil and Distillate Stocks		Residual Fuel Oil Stocks	
	Barrels Daily	Week Ended	Barrels Daily	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended	Barrels	Week Ended
Highs:												
1941	4,337	11–22	4,120	10–18	266,187	3–29	99,727	3–29	[1]54,983	11–15	102,448	1– 4
1942	4,337	2– 7	3,961	1– 3	263,208	3–28	[1]109,281	3–14	49,861	11–14	95,857	1– 3
1943	4,436	11–13	4,331	12– 4	245,752	5–29	94,159	3–20	46,187	11–27	72,881	1– 2
1944	[1]4,587	7– 1	[1]4,752	6–17	240,992	1– 1	89,162	4– 1	42,310	1– 1	57,330	1– 1
Lows:												
1939	[2]1,601	8–26	3,125	2–18	[2]229,127	10–12	71,152	10– 7	20,722	4–15	105,397	4– 8
1941	3,364	1–11	3,490	1–18	240,399	11–15	79,923	10– 4	28,381	4–12	[3]90,914	7–12
1942	3,297	7– 4	3,393	5–23	231,896	12–12	75,934	12– 5	29,240	4–25	72,962	12–26
1943	3,821	1– 9	3,579	3–13	232,191	1– 9	68,182	10–16	30,732	4– 3	57,596	12–25
1944	4,357	1– 1	4,228	2–12	[4]228,660	7– 1	76,302	1– 1	30,232	4–29	49,737	3–18

TRENDS OF 1943 AND 1944

Trends in Week Ended:	Crude Oil			Gasoline		Gasoil and Distillate		Residual Fuel	
	Production Daily	Runs to Stills Daily	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End	Production Weekly	Stocks Week End
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	3,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	237,219	12,813	69,297	4,642	44,591	7,968	63,833
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 26	4,423	4,377	237,137	13,183	85,248	4,558	33,766	8,952	51,387
March 25	4,385	4,443	236,285	13,362	87,287	4,979	31,319	9,013	51,669
April 1	4,383	4,435	234,667	13,824	89,162	4,450	30,530	8,367	51,326
April 29	4,431	4,300	235,342	13,126	88,462	4,284	30,236	8,398	49,985
May 27	4,514	4,532	234,423	13,502	86,468	4,702	32,035	8,568	49,812
June 3	4,523	4,620	234,476	13,680	87,084	4,890	32,586	9,157	50,283
June 10	4,523	4,670	231,290	14,220	86,911	4,996	33,669	9,008	51,221
June 17	4,568	[1]4,752	230,565	14,398	85,268	4,870	34,137	9,489	52,017
June 24	4,583	4,638	229,332	14,066	86,000	4,337	34,328	8,961	52,757
July 1	[1]4,587	4,638	228,860	14,052	83,559	4,496	35,360	8,872	52,235
July 8, 1944	4,579	4,645	.....	13,539	83,709	4,548	36,189	9,009	53,656
July 10, 1943	4,090	3,929	[5]240,927	11,192	76,668	3,506	33,221	8,185	66,681
Change:									
in week	—8	+7	—472	—513	+150	+52	+829	+137	+1,451
In year	+489	+716	—12,067	+2,347	+7,021	+1,042	+2,968	+824	—12,995
In year	+11.9%	+18.2%	—5.0%	+21.0%	+9.2%	+29.7%	+8.9%	+10.1%	—19.5%

[1] All time peak. [2] Lowest between April, 1922, and July 1, 1944. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent states. [4] Lowest since April, 1922. [5] Stocks, July 3, 1943.

Gasoil and distillate-fuel production of 4,548,000 barrels during the week, 52,000 barrels more than the week ending July 1, allowed slightly reduced demand to make itself apparent in an addition of 829,000 barrels to storage, bringing total now to 36,189,000 barrels, higher than at any time since February 26, 1944, and 8.9 percent more than a year ago.

Residual-fuel stocks also were increased during the week, now standing at 53,686,000 barrels with addition of 1,451,000 barrels since July 1. This level is 829,000 barrels higher than at any time since January 1, although still 12,995,000 barrels below storage position a year ago.

IPAA Executive Group To Hold Special Meeting

Application of the government subsidy on wells of small production, the price of crude oil, a permanent price differential for wells of small production, the depletion allowance and regulation of imports are some of the topics to be discussed by the executive committee and vice presidents of the Independent Petroleum Association of America called to meet July 25-26 in Fort Worth. This is a special meeting to consider these and other matters "on which action should be taken before the annual meeting in October", according to Ralph T. Zook, president. Matters dealing with the association's program also are on the agenda.

California Producers Elect Sub-Committees

Its two standing sub-committees were elected June 28 by the conservation committee of California Oil Producers as follows:

Administrative committee: Henry F. Power, General Petroleum Corporation, chairman; E. Robert Burns, MacDonald and Burns; Russell H. Green, Signal Oil and Gas Company; and R. P. Huggins, Western Gulf Oil Company, and D. W. Elliott.

Allocation committee: R. I. Brown, Standard Oil Company, chairman; Warren Craddock, Pacific Western Oil Corporation; John Hancock, Hancock Oil Company of California; W. L. Jarvis, The Texas Company; Joseph Jensen, Tide Water Associated Oil Company; R. C. Patterson, Belridge Oil Company; and John L. Stephens, Chanslor-Canfield Midway Oil Company.

Blackwell-Burbank Link Is Authorized by FPC

Cities Service Gas Company has received Federal Power Commission authority to build a 35-mile link to its pipe line between Blackwell and Burbank in Osage County, Oklahoma.

Kansas Consolidated Gas Company is seeking permit for 215 miles of 18-inch gas line from Hugoton gas field to Wichita, Kansas. The line would supply additional fuel for Wichita and Kansas City.

Increased demand prompted purchasers to boost July nominations from the

Charlson sand in the Chickasha field of Grady County, Oklahoma, to 500,000,000 feet or 16,125,000 feet daily. June runs totalled 342,017,000 feet. Oklahoma Natural Gas Company nominated 150,000,000 feet for July; Lone Star Gas Company asked for 225,000,000; Little Nick Oil Company nominated 50,000,000 and Consolidated Gas Company 75,000,000 feet.

Sinclair Enlarging Line Outlet in North Texas

Sinclair Refining Company is revamping its gathering system in the Hildreth field, most active drilling center in North Texas, to provide a larger outlet and to handle the oil from lease tanks by gravity. A booster station that will handle 5000 barrels daily is under construction immediately north of production, in the northeast corner of the W. E. Davis Survey. Hodges Construction Company has contract to lay 1¼ miles of 4-inch and 3½ miles of 6-inch, the latter including a line to connect with the company's Mid-Continent multi-unit system.

Dickey Oil Company Sells Kansas-Oklahoma Holdings

Gulf Oil Corporation is negotiating purchase of Dickey Oil Company's properties in Oklahoma and Kansas, including 4000 barrels daily oil production and some leases in the West Edmond field. Consideration involved may be as high as $4,000,000. Gulf Oil Corporation officials said "details are being ironed out before final papers are signed." Dickey Oil Company will move operating headquarters to Denver, already having some interest in Colorado, including a wildcat test now drilling.

Sinclair Engaged in Extensive Wildcatting

Sinclair Oil Corporation subsidiaries are embarked on one of the most active wildcat drilling campaigns in the history of the organization.

Subsidiaries have 54 wildcat tests scheduled for the year, 5 of which have been completed as discoveries and 13 failures. The remaining 36 locations include 4 deep tests in Mississippi and 2 10,000-foot tests in Colorado County, Texas. The deepest wildcat drilled by the organization is the 12,300-foot hole in Winkler County, Texas, which is being tested.

Montana Board Members

Four men have been named members of the Oil Conservation Board of Montana for the term ending January 1946 as follows: A. B. Cobb of Cut Bank and Great Falls, L. J. Yealy of Shelby, M. R. Wagner of Cut Bank, Caspter T. Oien of Oilmont and C. A. Haeckel of Bozeman.

Madeira Islanders Are Imported To Curacao

A serious shortage of both skilled and unskilled workers, needed to maintain capacity operation of refineries on Curacao, has been greatly alleviated by the importation of 1200 workers from Madeira Island, the Portuguese possession off the coast of Morocco.

International Developments

"Special Privileges" in Venezuela's New Oil Law Opposed by Companies

ENCOURAGED by the efforts of the government of Venezuela to bring about more intensive development of that country's petroleum resources, more than a dozen additional companies have applied for concessions there in recent months. Companies already active have been progressively increasing the tempo of their operations, and the stage appears set for great expansion of the petroleum industry in this, the leading producing and refining area south of the Rio Grande.

However, in spite of the hopes of Venezuelans, and the willingness of American and British companies to cooperate, some of the provisions of the new and supposedly more liberal petroleum laws of Venezuela have been found to be discriminatory, and have provoked the outspoken disapproval of companies that have made plans to get in on the play or to expand operations there.

Troublesome Sections

Particularly troublesome is that part of the Venezuelan law which requires that at least 10 percent of the oil produced in concession areas obtained since passage of the new laws must be refined in Venezuela, and that at least 80 percent must *not* be refined within the boundaries of an area that takes in all the countries along the north coast of South America, the West Indies and Central America. This is an obvious attempt to obtain economic control of the marketing territory of the entire Carribbean area. That factor is enough cause for alarm; but its ramifying possibilities are even more alarming in the eyes of the companies.

They regard it as the granting of special privilege to those firms that are automatically exempted from the provisions of the law—in other words, those companies favored by previous long-term arrangements or committments to which such provisions of the new laws do not apply.

Processing of most of the recently submitted concession bids is being held up as a result of this situation, in the hope that the law will be modified by the Venezuelan congress or that diplomatic effort will be successful in accomplishing some sort of revision. It appears, however, that the Venezuelan government is not disposed to modify very much the position it has taken in the matter. It can therefore be seen that the current surge of exploration and development may be short lived unless a better deal is worked out.

To the credit of Venezuela it must be said that the revision of import duty schedules on oil field supplies and equipment has greatly reduced the expense of operating. The reduction in these tariffs has taken place exactly as promised when the new petroleum laws went into effect.

The Venezuelan transaction stamp system, another expensive and time-killing institution, is due to be abolished within a few weeks, except that it will still apply in the case of major transactions, and will not involve the payment of exhorbitant fines for infractions, voluntary or otherwise. In the past, every transaction engaged in by the oil companies has required the affixing of revenue stamps—from pay-checks to the purchase of a used derrick.

In addition, the labor situation is excellent in Venezuela at the present. In fact, nothing stands in the way of desired expansion of exploration, drilling and production except the attitude of the government itself and certain shortages of supplies and equipment due to the war situation. Every piece of usable equipment is in service now in Venezuela, even some that had been previously discarded as obsolete. Stocks of pipe and well-operating equipment are fairly adequate, but there is a great shortage of drill pipe, tool joints, rigs and derricks—particularly of equipment required for drilling holes deeper than have previously been drilled in the country. This situation, of course, prevails in the United States as well.

Lake Maracaibo Best

The best chance for increasing production in Venezuela lies in tapping the deep Cretaceous pays of the Lake Maracaibo region. Their occurrence was recently proven by the Shell-Union Oil Corporation's strike that extended the La Paz field several kilometers north and proved a prolific Cretaceous pay at 4400 feet. This discovery has caused all companies operating in western Venezuela to plan extensive exploration and development of deeper sands.

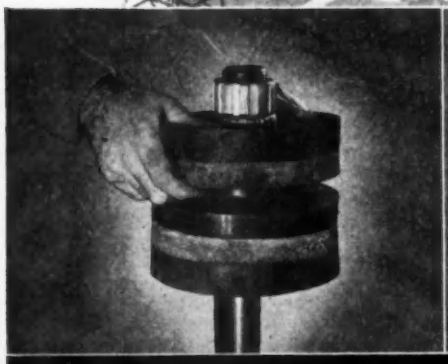
Carrying out of such a program, however, depends entirely on the ready availability of necessary supplies and equipment. Big derricks, high pressure boilers, heavy duty rigs, trucks and other "big stuff" are required for accomplishing such objectives. There are none in Venezuela, since they have not been used there in the past. Neither are they available in the United States. They simply are not being manufactured, because of the war situation.

Possibilities of eastern Venezuela cannot be appraised with any certainty. Such important fields as Mulatta, with its recent northward extension, prove that other prolific fields eventually will be located and developed in the Llanos region, and perhaps even in the semi-mountainous belt along its northern border. That part of Venezuela, though, is far inland, and therefore from the standpoint of immediate prospects, comparatively inaccessible.

☆

PHIL J. LEHNHARD, for several years connected with the research department of Dowell Incorporated at Tulsa, and more recently district engineer for the company in West Texas, is now associated with United Geophysical Company as a petroleum engineer.

"CHANGE THE RUBBERS and SAVE THE PISTON!"



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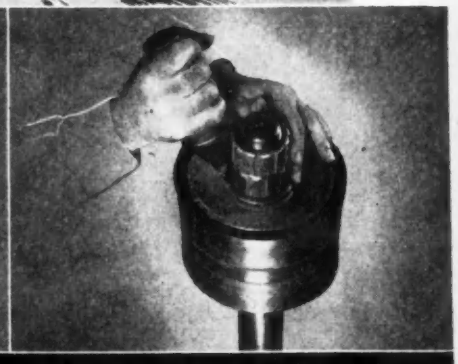
2. It's not even necessary to remove the piston body from the rod. You save on shut-down time when rubbers are changed.



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They work together for best all round performance

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U. S. Field Operations

Illinois Basin

Illinois Work at Year Peak; Discovery in Jasper County

Schuller and Witt completed Lawrence 1, NE SW SE 3-5n-9e, Jasper County, opened the South Bogota pool with 57 barrels of oil daily from the McClosky lime at 3054-65 feet after 5000 gallons of acid.

Operations in Illinois included 205 wells drilling, 43 locations, 20 rigging and 23 inactive. First reports totaled 52 of which 9 were wildcats. Total of all operations at 291 set the high mark for the year. Sixty-two wildcats were underway and they included 43 drilling, 8 locations, 7 wells rigging tools and 5 inactive.

Wayne County: Pure Oil Company's Wayne County Farm 1, SW SE NW 24-1s-7e flowed oil in 10 minutes from McClosky lime with hole bottomed at 3332 feet. The well is 2½ miles north of Fairfield.

Richland County: Pure Oil Company's Smith 1, SW SE SE 35-3n-8e, flowed oil in 26 minutes after making gas in 6 minutes from McClosky lime.

Jefferson County: The Texas Company's Kasban 1, SE SE NW 8-2s-1e, northeast of Woodlawn, yielded 700 feet of oil and 200 feet of oil-cut mud from Benoist sand at 1916-42 feet during a drill-stem test.

Effingham County: Bonnie Heath's Walker 1, NW NW SE 22-6n-6e, wildcat, has been abandoned at 2824 feet. Magnolia Petroleum Company has moved tools on location for Tieman 1, SE SW SE 2-7n-6e, a wildcat two miles southeast of Effingham.

Madison County: Ray Frank has staked location for Bassett 2, 23-6n-9w, a wildcat near Alton.

Perry County: Sohio Oil Company has moved in rotary tools for Schuckomski 1, 5-4s-2w, a wildcat test near Pinckneyville.

Indiana

Most promising wildcat in Indiana was The Texas Company's Fiscus 1, SE SE NE 2-9n-5w, in Owen County. Shows of oil were encountered in the Trenton lime topped at 2330 feet. The well was drilling in the Devonian below 2488 feet.

Kentucky

Sohio Production Company was still waiting on cement at Rash 1, 24-Q-25, a wildcat in the southeastern part of Henderson County, to test a show in the Tar Springs sand at 1727 feet. A show of oil in Pennsylvanian sand was so good that the operators plan to drill a shallow well in Section 16.

Union County: Gulf Refining Company was drilling below 2150 feet at Rankin 1, 16-Q-20, a wildcat which may open a new pool in the Waltersburg sand at 1814 feet. The well made 330 feet of oil during a drill-stem test. Delta Drilling Company's Buckner 1, 18-P-20, showed 60 feet of oil and no water during a drill-stem test of Pennsylvania sand at 890 feet. No water showed. Operators were drilling at 1990 feet with intentions of plugging back.

McLean County: Charles Morburger's Troutman 1, 13-M-29, held promise as a pool opener. Pipe was set to test show in the Pennsylvania sand at 1009-29 and 1054-70 feet, with total depth 1425 feet.

Texas-Illinois Properties Sold by Lain Oil Company

The Texas Company has purchased the Illinois and Texas properties of Lain Oil Company for a reported consideration of $500,000. Included were 28 wells producing 140 barrels daily in 5 Illinois pools, and leases in Texas and Illinois.

Northern Ordnance Quits Horizontal Drilling Job

Excessive cost of operation has resulted in temporary abandonment by Northern Ordnance, Inc., of a horizontal well drilling project near Pleasantville in northwest Pennsylvania where the company recently acquired a block of 20,000 acres. The shaft had reached 67 feet when orders were given to discontinue. The project called for the drilling of five horizontal holes into producing sands, the fifth to be used for repressuring.

☆

CECIL ROBINSON has joined Coastal Refineries, Inc., as chief geologist. He has been in charge of operations in the Rio Grande Valley for Arkansas Fuel Oil Company at McAllen, Texas.

California

Fresno County Field Opened With 1500-Barrel Flow

A new oil field of indicated importance was opened last week with completion of Tide Water Associated Oil Company's Jacalitos 27-16, NE SW SW 16-21-15, on the Jacalitos Anticline, Fresno County. On production test the well made an initial flow of 1500 barrels of 33-gravity oil, with 200,000 feet of gas, through a 28/64-inch choke with pressures of 560/420 pounds. Production is from Third Variegated sand in the Temblor, of Miocene age, with perforations between 3860-3846 and 3828-3806 feet. Known characteristics of the anticline's well-defined geology in the immediate vicinity of the strike encourages hopes that the extent of the pay may be 500 or more acres.

Wildcat statistics of the week included heavier than usual listings on both sides of the ledger, abandonments as well as starts. Eleven failures were reported, as against 10 starts. Average depth of 9 of the 11 failures was not much in excess of 3000 feet.

Fresno County: Turk Anticline again will be wildcatted by Standard Oil Company, site for an initial test having been announced as SW SE NE 3-16-14.

Los Angeles County: Richfield Oil

Wells Completed in the United States in Week Ended July 15, 1944

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative: This Year	Last Year
Alabama	....	....	....	....	....	....	....	....	....	....	....	....	14	1
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	3	....
Arkansas	....	....	....	....	....	....	....	....	....	....	....	7	105	140
California	25	....	....	....	25	3	2	....	11	13	41	40	1,078	725
Colorado	....	....	....	....	....	....	....	....	....	....	....	....	12	11
Florida	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	1	2
Illinois	26	....	....	13	39	....	....	....	13	13	52	45	929	918
Indiana	....	1	....	2	3	....	....	....	....	....	3	6	146	131
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	2	3
Kansas	17	1	1	11	30	....	....	....	10	10	40	48	953	851
Kentucky	8	....	....	7	15	....	....	....	2	2	17	13	377	161
Louisiana	8	1	....	4	13	....	2	....	....	2	15	11	385	325
North Louisiana	2	1	....	2	5	....	....	....	....	....	5	....	125	143
South Louisiana	6	....	....	2	8	....	2	....	....	2	10	11	260	182
Michigan	....	....	....	....	....	....	....	....	....	....	....	10	318	269
Mississippi	3	....	....	....	3	....	....	....	....	....	3	2	76	48
Missouri	....	....	....	....	....	....	....	....	....	....	....	....	13	13
Montana	7	2	....	4	13	....	....	....	4	4	17	....	170	118
Nebraska	....	....	....	....	....	....	....	....	....	....	....	....	7	27
New Mexico	3	....	....	1	4	....	....	....	....	....	4	9	223	132
New York	15	....	10	....	25	....	....	....	....	....	25	25	675	616
Ohio	3	7	....	8	18	....	....	....	....	....	18	3	439	461
Oklahoma	19	6	....	3	28	....	5	3	5	13	41	21	916	685
Pennsylvania	27	3	15	2	47	....	....	....	....	....	47	51	1,409	1,313
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	7	5
Texas	49	4	....	22	75	1	5	....	20	25	101	112	3,158	2,056
E.Tex.Bor. Co.'s	....	....	....	....	....	....	....	....	....	....	....	....	11	14
E. Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	3	5
Rest of E. Texas	2	1	....	....	3	....	1	....	4	5	8	6	161	117
North Texas	13	....	....	11	24	....	1	....	2	3	27	20	732	480
W. Central Tex.	3	....	....	2	5	....	1	....	5	6	11	7	217	177
West Texas	15	1	....	3	19	....	....	....	1	1	20	28	833	462
Tex. Panhandle	3	2	....	....	5	....	....	....	....	....	5	5	123	111
G. Coast, Upper	2	....	....	1	3	1	....	....	2	2	6	19	299	153
G. Coast, Lower	8	....	....	4	12	....	1	....	4	5	17	14	485	312
Southwest Texas	3	....	....	1	4	....	....	....	1	1	5	11	240	190
S. Central Tex.	....	....	....	....	....	....	1	....	1	2	2	2	54	35
West Virginia	....	18	....	4	22	....	....	....	....	....	22	14	492	312
Wyoming	4	....	....	....	4	....	2	....	....	2	6	....	85	63
Total U.S.	214	43	26	81	364	4	16	3	65	84	452	417	11,994	9,386

* Includes distillate wells. † Includes salt water disposal wells.

Corporation, after a lapse of six years, has resumed drilling in El Segundo field. The field now produces only a negligible amount of oil, but recent drilling opened gas sands at 4000 feet that had been passed up when the field first was drilled.

San Bernardino County: The start of a wildcat in the Hisperia area is announced by Lee Salter, location being given as NEc 34-4-5, on property formerly held by Ute Oil Company.

Missouri

Atchison County Wildcat Abandoned by Operator

Homer Browning's Fee 1, C SW SW 28-64n-40w, Atchison County, Missouri wildcat southeast of Fairfax, abandoned at 1560 feet. Just west of the Tarkio pool Short's Griffen 1, NW NW 15-65n-40w, was drilling below 1300 feet after setting pipe at 1198 feet, and in the Tarkio pool Cities Service Oil Company was cleaning out Watkins 2, C NW SE NW 32-65n-39w, after shooting the Bartlesville sand at 1391 feet. Watkins 3, NW SW NW 32-65n-39w, was preparing to drill plug with oil string set at 1434 feet in Bartlesville.

☆

O. R. CHAMPION, West Texas district geologist for the Seaboard Oil Company, Midland, has resigned to become division manager of the Alder Petroleum Corporation, a subsidiary of the Newmont Mining Corporation, New York, and will establish headquarters at Fort Worth. S. J. Taylor goes from Corpus Christi to Midland to succeed Champion.

Oklahoma

West Edmond Gets Third Extension in Three Weeks

West Edmond paced Oklahoma oil activities last week as Phillips Petroleum Company gave the pool a mile east extension with Coder 1, CSE NE 9-14n-4w, Oklahoma County, which flowed 350 barrels of oil through ½-inch tubing choke in the first three hours of test from the Bois D'Arc section of the Hunton at 6588-6638 feet. This is the field's third extension in three weeks, all by Phillips Petroleum Company which now has 19 operations in the field, 12 locations and 20 others surveyed. This gives the pool which embraces three counties including Oklahoma, Canadian and Logan, a total of 133 operations of which 115 are in Oklahoma County, 15 in Canadian and 3 in Logan.

Sohio Petroleum Company's Leonard 1-B, CSE NW 30-14n-4w, was setting casing at 7000 feet after topping Hunton at 6900 feet with base of Bois D'Arc at 6978 feet and McDowell 1, CSE SE 33-14n-4w, topped Hunton at 6648 feet and was drilling below 6700 feet.

Continental Oil Company's Casey 1, CSW SE 21-14n-4w, was ready for production test after cementing pipe at 6679 feet, total depth. An outpost, the well found good saturation in the Hunton. Mid-Continent Petroleum Corporation's Peterson 1, CNW SE 19-14n-4w, is drilling below 6400 feet, and its Lynch 1, NE NW 18-14n-4w, one of the pool's best producers has been pinched back to 200 barrels per day.

In southwest Oklahoma County, 24 miles south of West Edmond and along the same general geologic trend, Stanolind Oil & Gas Company has leased Section 36-11n-4w, paying $2.50 an acre. The lease is from the state and the company has additional acreage in the vicinity on a possible northwest trend play from the West Moore pool, Cleveland County.

West Moore: A second failure for this deep pool loomed as Sinclair Prairie Oil Company's Theimer 1, NE SW SW 20-10n-3w, Cleveland County, recovered a dry core in the second Wilcox at 8726 feet and was drilling dry white sand below 8796 feet. The test is ¾ mile north of production and was checked 70 feet higher than the field wells until it reached the Mississippi section which thickened considerably and changed the picture. Mid-Continent Petroleum Corporation's Westermier 2, NE NW SW 26-10n-3w, north offset to Westermier 1, discovery well of the South Moore pool, set surface and is moving in heavy-duty rig. Helmerich & Payne's Brand 1, NE SE SW 26-10n-3w is ready for derrick.

Atoka County: Northern Ordnance has a possible pool opener in Fulton Ranch 1-S, SW SW SW 19-1s-12e, 5 miles northeast of Atoka and near the Chocktaw Fault. A good oil show was reported at 4925-75 feet. The test topped the Bromide sand at 5155 feet and a core at 5162-69 feet showed gas. The wildcat is drilling below 5200 feet.

Carter County: With three pay sands in the Pennsylvania proven and a fourth

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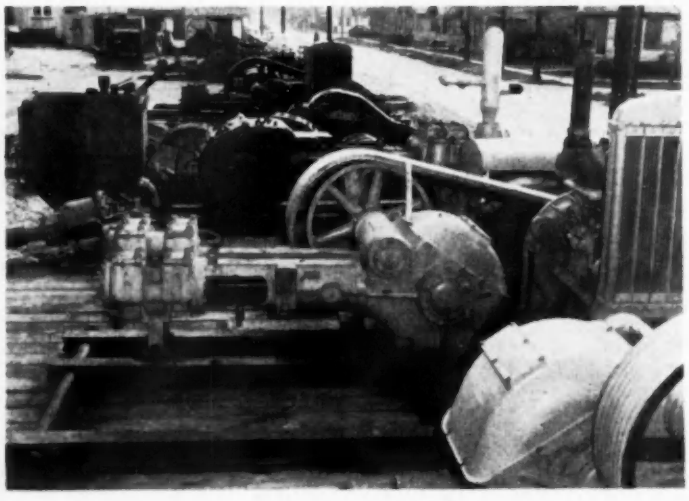

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showing, The Texas Company Duke 1, SE SW NW 5-5s-1w, northeast offset to the operator's discovery well which opened the Lone Grove pool, was drilling below 3700 feet. Drill-stem tests at 3470-75, 3506-15, 3543-58 feet filled the hole with oil. Core at 3631-37 feet showed saturation. The discovery well is producing from 2780 feet.

Continental Oil Company's Fowler 1, NW SE SW 31-2s-2w, tested 300 feet of oil and some gas after casing was perforated and ripped at 6894-6914 and 7018-25 feet. Cleaned to bottom with no oil in the hole the wildcat is drilling below 7035 feet.

Washita County: Gulf Oil Corporation is rigging up standard tools on Shields 1, SE NW SE 11-8n-20w, after setting pipe at 6690 feet, total depth. Electrolog showed water in all sands below 5710 feet. The company's Hare 1, NE SW 8-8n-20w, is cleaning out at 6195 feet, total depth. The well flowed 100 barrels of oil and 25 barrels of water from the first Granite Wash zone on tests at 5940-55 and 5970-80 feet, with four million feet of gas.

Garvin County: Leland Cooper's Potter 1, SW SE 8-4n-3e, is perforating sand at 2649-56 feet where electrolog showed possible oil. Hole was drilled to 3506 feet and plugged back to 2690 feet.

Seminole County: Sunray Oil Company's Jonas 2, SW NE SW 17-5n-8e, swabbed in at 400 barrels of oil per day. After 500 gallons of acid through tubing initial production test recovered 700 barrels in the first 24 hours on flow. Total depth is 4083 feet with production from the second Wilcox at 4073-80 feet.

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Kansas

New Pool and Likely Pool Opener Feature the Week

A new pool and a probable pool opener featured Kansas oil activities last week as the state reported 347 drilling operations as compared with 272 and 77 wildcat tests against 67 this time last year.

Barton County: A new pool a mile west of the Trapp field has been opened by Phillips Petroleum Company's Chal 1, SE SE SW 25-16s-14w, which is installing pumping unit after swabbing at the rate of 350 barrels of oil a day on initial test from the Arbuckle topped at 3401 feet. Pipe was set at 3404 feet and hole drilled to 3440 feet, and acidized with 1000 gallons.

Finney County: Carter Oil Company's Miller 1, NEc SW 26-22s-34w, in Southwest Kansas 12 miles northeast of the Hugoton gas field, blew half a million feet of gas per day on drill-stem test at 2613-24 feet in the Permian or upper Pennsylvanian. The pay section was topped at 2525 feet and pipe is being set for test.

McPherson County: M. & L. Oil Company's Johnson 2, SE SE 7-17s-3w, which established deeper Viola lime production in the Lindsborg pool, has been given a potential of 2000 barrels of oil daily after deepening to 3400 feet and acidizing with 2000 gallons. The new pay is at 3339-46 feet.

Stafford County: Barnsdall Oil Company is moving in standard tools to drill in Matthews 1, NW NE NE 15-25s-14w, for a test at 3678-79 feet where saturated core with good porosity was recovered. Seven-inch was set on bottom at 3679 feet.

Phillips County: The Texas Company's Witt 1, NE SW 35-5s-20w, 1½ miles east of the Roy pool, logged a good oil show in the Reagan sand at 3352-62 feet and is drilling below 3387 feet.

Nebraska

Drilling Is Resumed in Butler County Wildcat

After shutting down at 310 feet, Bellewood Syndicate, Ltd., has resumed drilling in Nicholas 1, SEc NW 29-16n-2e, wildcat in north Butler County, Nebraska, and is reported below 2200 feet. The test topped the Hunton at 1360 feet but recovered salt water and a little oil at 1503-30 feet, the oil being exhausted after bailing. Another test at 1540-45 feet recovered salt water, no oil. Viola lime was topped at 1727 feet, Simpson sand at 2117 feet and Arbuckle lime at 2185 feet.

☆

DEWEY JORDAN, production superintendent for the Atlantic Refining Company in the West Texas-New Mexico district, has been transferred from Midland to Dallas to become superintendent of drilling and production in all districts. Jordan is succeeded by Lee Hays, former assistant. B. E. Moir, East Texas field superintendent, has moved from Longview to Dallas to become chief engineer in charge of mechanical, and civil engineering and laboratory departments. S. R. Bumann, assistant supervisor of industrial relations in Southwest district, has been made an administrative assistant.

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West Texas

Fullerton Field Well Gets Oil from Wolfcamp

Oil production from the Wolf camp, or basal Permian, is assured for the Fullerton field, Andrews County, through Mid-Continent Petroleum Corporation's University 1, Lse. 7, having indicated a commercial well when tester was used at 8461-8685 feet. Fifty-minute test yielded the water cushion then 450 feet of rotary mud, 2700 feet of oil-cut mud, 1170 feet of 38.6-gravity oil, 360 feet of oil-cut mud and 450 feet of sulphur water. Bottom-hole pressure was calculated at 4500 pounds. This showing is from broken pay, identified as cavernous porosity, at 8470-8625 feet. This deep prospect is 1½ miles southeast of 7000-foot Clear Fork production, and failed to make a producer in the field's regular pay due to subnormal porosity and permeability rather than due to structural position. Nearby lease owners contributed $50,000 toward the drilling of an Ellenburger test, so a compromise must be worked out if the outpost is completed in the Wolfcamp. The strike logged top of San Angelo at 5565 feet and Fullerton, or Tubb, sand at 6540 feet with elevation of 3295 feet. Base of black shale and red shale was called at 8150 feet and 8255 feet respectively.

The Fullerton field yields high-gravity sweet oil that is comparable to regular Mid-Continent grade, and has the largest undrilled proved area in the Permian Basin without giving consideration to the deeper zone. Frankel Bros. et al's University 1-D, situated 1 2/3 miles from nearest production and on the southeast side of the field, flowed 34 barrels hourly after using 6000 gallons of acid in Clear Fork pay at 6845-86 feet. This is from the upper pay. This outpost entered San Angelo at 5660 feet and Tubb sand at 6585 feet with elevation of 3290 feet.

Crane County: The Texas Company's Hobbs 1-A, 3¾ miles southwest of McCamey field, and the first producer for the state from the Devonian, has been killed with prepared salt water to perforate opposite additional pay section. This strike showed for a commercial well last May at 5300-50 feet, and has been shut in, except for occasional brief gauges. The company's Hobbs 1-B, southwest offset, was drilling at 5037 feet, having passed up good porosity and some oil stain, according to samples, at 3500-3750 feet in San Andres, topped at 2130 feet, or 2 feet low.

Winkler County: Gulf Oil Corporation's Keystone 49-E, scheduled Ellenburger test for the Keystone field, paved the way for expansion of the Holt oil zone in flowing oil at the rate of 20 barrels hourly when tester was used at 4712-72 feet. Coring was resumed to establish base of pay before landing protection pipe. The company's Keystone 1, discovery for the regular Permian lime zone, has been deepened to the Holt, logging top of porosity at 4518 feet, and best oil saturation at 4715-50 feet. Drill-stem test at 4760 feet yielded a flow of 10 barrels hourly of 39.4-gravity oil. Sun Oil Company's Keystone 2, 2½ miles northwest of the discovery well for the Keystone-Ellenburger field, is causing some sharp revisions in the prospective producing area of the deep zone through having entered Devonian at 8080 feet with elevation of 2979 feet, being 736 feet low.

North Monahans: Stanolind Oil & Gas Company's Sealy-Smith 2, mile east of its discovery in the 6200-foot Clear Fork, drilled to water at 6399 feet then set pipe near bottom, while Sealy-Smith 4, west offset to the discovery, cemented 5½-inch at 6297 feet, 6 feet off bottom. Perforation of pipe for production test was underway on both. The Texas Company's Hogg 1, 1¼ miles northwest of the discovery was drilling at 2325 feet, and DeKalb Agricultural Association's Mitchell 1, 1¼ miles east, logged base of salt at 2400 feet with elevation of 2802 feet, and was drilling at 4500 feet.

Prospects: Humble Oil & Refining Company's Jackson 1, southeast corner of the county, was drilling brown dolomite at 6094 feet, and last drill-stem test yielded 50 feet of oil-cut mud at 5893-5980 feet. This wildcat has logged an unusually thick section of broken saturation below 5300 feet. In Garza County, Honolulu Oil Corporation and Devonian Oil Company's Dayton 1, 12½ miles northwest of production, is installing pump, having swabbed at the rate of 200 barrels of fluid daily, averaging 50 percent oil and balance salty-sulphur water. It was plugged back from 3768 feet to 3564 feet, and treated with 3000 gallons of acid. Phillips Petroleum Company's Ada Price 1, Pecos County record depth test at 15,279 feet has been idle since failing to make a producer in Ellenburger. Shell Oil Company's Tankersley 1, Irion County prospect that drilled to Hickory (Cambrian) sand at 8305-57 feet, then landed pipe at 8084 feet, is also idle after using 2000 gallons of acid in undetermined zone. Phillips Petroleum Company's Spiller 1, Kimble County wildcat that touched off a large-scale lease play in the plateau region, was awaiting acid treatment after deepening from 2405 feet to 2460 feet in Ellenburger, topped at 2375 feet. This well flowed a small volume of oil with gas, then exhausted the oil at 2405 feet.

Gaines County: Stanolind Oil & Gas Company's Riley Estate 1, 8 miles west by south of Cedar Lake field, nearest production, was testing for shutoff in split casing after plugging back from 5176 feet to 5141 feet. This wildcat showed promise of opening a new oil area when tester was used at 5060-5137 feet. Ray Albaugh and Whittaker Oil Company's Scanlan-Stanolind 1, 3 miles north of east edge of the Cedar Lake field, showed nominal porosity and oil stain in cuttings at 4960-82 feet, and prepared to core.

Deeper Howard Zone Found More Productive

Northern Ordnance's Mary Howard 1-B, offsetting 3700-foot production in the Howard pool, Fisher County, established a deeper and more productive zone in flowing 126 barrels of 40-gravity oil through ½-inch choke on official gauge. Production is from lime at 5562-5602 feet in Strawn, topped at 5560 feet, and the zone was treated with 3000 gallons of acid. The company is drilling 2 additional tests to this deeper pay.

Eastland County: Lone Star Producing Company's League 2, SW SW SE SP. 467, flowed 167 barrels of oil natural with 1,000,000 feet of gas on 5/64-inch choke from Ellenburger at 3939-76 feet.

☆

A. W. GREEN of Cities Service Oil Company, Bartlesville, Oklahoma, has been appointed chairman of the Kansas Steering Committee of the Mid-Continent Oil and Gas Association's standing committee on state and local taxes. J. E. Jarvis of Bartlesville, in charge of Cities Service's excise and sales taxes division, has been appointed chairman of the excise taxation sub-committee of Kansas.

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North Texas

Young County Oil Strike Makes 155-Barrel Flow

Northern Ordnance has opened an oil pool in southwestern Young County through its F. H. Robertson 2, F. L. Green survey having flowed 155 barrels of 42-gravity oil on official gauge through ½-inch tubing choke from Marble Falls sand perforations at 4175-80 feet. Sinclair Refining Company is building a 2-mile 2-inch line to the discovery. The company's Robertson 1, west offset, is a small gasser in the same horizon after plugging back from Ellenburger at 4660-76 feet, while Robertson 3, north offset to the oil producer, was drilling to Ellenburger after missing the Marble Falls pay.

King County: Shamrock Oil & Gas Corporation and Roeser-Pendleton's Masterson 1, projected 7000-foot test on a 20,032-acre lease and 10 miles north of the Bateman field, was drilling at 3807 feet in lime, topped at 3575 feet. Drill-stem test at 3658-94 feet returned 90 feet of oil-cut mud and 600 feet of salt water to indicate that it may be near a productive area. In the Bateman field, Humble Oil & Refining Company's Bateman 4, situated near 3600-foot oil producers, was awaiting acid treatment after showing promise of a new deep zone from perforations at 5325-60 feet, having plugged back from granite at 6380-88 feet. Gulf Oil Corporation's Masterson 1, Ellenburger wildcat, was sidetracking at 5630 feet with junk in old hole at 5710 feet.

Archer County: Consolidated Oil Company and Premier Oil Refining Company's Garrett 1-B, half-mile southeast of their recent 3800-foot Strawn discovery, landed 5½-inch at 4655 feet, 5 feet off bottom, after recovering 15 feet of gas-cut mud on drill-stem test at 4650-60 feet in Bend, topped at 4648 feet, or 19 feet low. The discovery was drilled to Ellenburger, and indicated possible production in Bend. Gulf Oil Corporation's Prideaux 1-E, 4¾ miles northwest of the Garrett discovery, entered Bend at 4743 feet, or 25 feet low, and was drilling at 4963 feet.

Wichita County: Maguire Industries et al's Cunningham-Swain 1, Section B, Tarrant County School Lands, 3 miles northwest of Iowa Park, failed to respond to 2-stage treatment with 2750 gallons of acid through perforations at 4347-71 feet in Ellenburger, topped at 4352 feet. This wildcat previously returned 90 feet of oil-cut mud when tester was used at 4353-76 feet. A shallow strike made in June by Akin-Dimock and The Sloan-Zook Company on the Krohn 260-acre lease, 5 miles northeast of Electra, is proving to be unusually productive. The partnership's first test was a failure, and Krohn 2 will be used as a key well for water flooding, while Krohn 3 pumped 65 barrels initial from sand at 1690-97 feet. Krohn 4 pumped and flowed 300 barrels initial from sand at 1685-92 feet, and Krohn 5 is rated at 250 barrels from sand at 1689-98 feet. The possibility of uncovering a pool of this type between old pools and failures accounts for a substantial portion of the shallow wildcat activity in the district.

Cooke County: Northern Ordnance's Adams 1, deepest of 5 active wildcats in east and central portion of the county, recovered 35 feet of oil-cut mud when tester was used in sand at 2326-30 feet, and was drilling sandy-shale at 3515 feet. The company has curtailed operations in the Woodbine area, where it has installed a gathering system and tank car rack, after recording 8 pumpers and 7 field failures, exclusive of 4 nearby wildcat dry holes.

Clay County: Continental Oil Company and Edge Oil Company's Crockett 1, Buffalo Springs prospect, was making swabbing test after using 2000 gallons of acid through Simpson dolomite perforations at 6580-6602 feet. The hole filled 500 feet with oil and 50 feet with rotary fluid in 18 minutes after pipe was perforated. A previous test at 6633-41 feet yielded 6000 feet of salt water from Ellenburger.

East Texas

Smith County Well Holds Up Oil Flow; Gas Increasing

The Smith County oil discovery by Phillips Petroleum Company on the McMinn 180-acre tract, Mary M. Long survey, is scheduled to be worked over due to rising gas-oil ratio. The oil flow remained constant the past week, having gauged 175 barrels of 45-gravity oil, with gas-oil ratio of 5700/1 through ⅛-inch choke on 23 hours and 23 minutes test as of July 11. Tubing pressure increased to 4558 pounds. Production is from perforations at 9918-29 feet in Odessa, topped at 9400 feet. Electric survey logged porosity at 9556-76 feet followed by nominal porosity at 9613-27 feet and maximum pay zone at 9869-9932 feet. Another 20-foot section of nominal porosity was topped at 9941 feet, while total depth was corrected to 10,017 feet. The pettit and Travis Peak, both prospective producing zones, have not been tapped.

Phillips Petroleum Company is seeking a pipe line extension to the field to support its scheduled program on the 13,000-acre lease block. An analysis of the oil shows it is sub-zero on cold test, with 34 percent gasoline and 15 percent kerosine, but low in octane. The lube stock is comparable to the Ranger bright stock.

Bowie County: Barnsdall Oil Company's Heilborn 2, prospective Smackover lime discovery, was preparing to try for completion through perforations after landing 5½-inch at 7695 feet, or 1-foot off bottom. Several drill-stem tests were unsuccessful. This wildcat entered Buckner at 7457 feet and Smackover at 7645 feet with elevation of 305 feet, being 35 feet and 55 feet higher, respectivly, than an offset failure. The dolomitic lime pay was entered at 7657 feet. A successful completion would give Texas its first production from the Smackover, which has become an important source of oil and gas in North Louisiana and Arkansas.

Wood County: Shell Oil Company and Sun Oil Company's Herring-Scoggins 1, southwest edge of the Manziel field, was awaiting orders in Travis Peak at 9140 feet, having logged good porosity but subnormal permeability in this zone. The Rodessa section, which has accounted for a small pumper on the southeast side of the field, proved dry. Sun Oil Company's Johnston 1 was drilling at 7650 feet, checking 10 feet low to the deep discovery. Magnolia Petroleum Company's McGee 1, wildcat, logged first anhydrite at 7325 feet, and drilling shale 7565 feet.

Van Zandt County: Northern Ordnance's Shelton 1, Martin Mills deep prospect, was running protection pipe at 5670 feet in Georgetown. The Texas Company's Easley 1 was coring water sand at 8730 feet in Travis Peak, topped at 8627 feet. Top of Pettit was called at 8505 feet.

Failures: Humble Oil & Refining Company's Stephens 1-B, ¾-mile northwest of its Larissa discovery, was abandoned at 11,347 feet in Travis Peak, topped at 11,025 feet, about 600 feet low. This second test for the area lost structural position through cutting faults in the Upper and Lower Glen Rose beds. The company's Surrat 1, Edgewood prospect, Van Zandt County, entered dry Travis Peak sandstone between 8630 and 8660 feet.

Southwest Texas

Victoria County Discovery Gauges 121 Barrels Daily

Kingwood Oil Company's Wilden 1, discovery well for the new Pridham's Lake field, west of the Victoria field in Victoria County, was gauged early last week, flowing 121 barrels of 24-gravity pipe-line oil in 24 hours, through a ⅛-inch choke for 9 hours and 5/32-inch choke for 15 hours. Tubing pressure was 400 pounds and casing pressure 475 pounds. Total depth of the hole is 4907 feet with production from Vicksburg sand through casing perforated at 4770-74 feet. Crown Central Petroleum Corporation is preparing to start an east offset to the discovery.

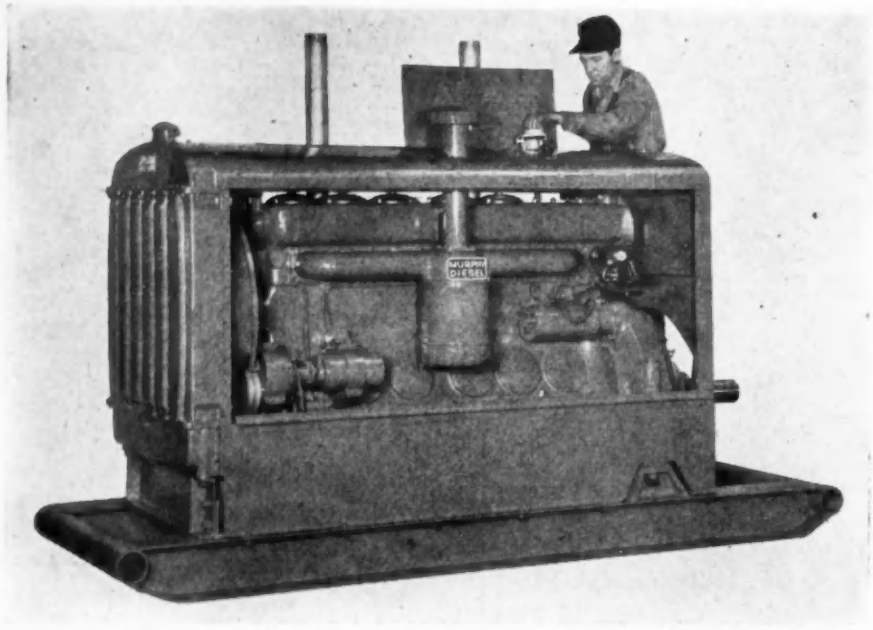
Jim Wells County: H. H. Howell's Lorena J. Spoonts has opened a new producing area a mile northwest of the North Magnolia City field, and on preliminary tests flowed at the rate of 155 barrels of pipe-line oil daily through a ⅛-inch choke, with tubing pressure 500 pounds and casing pressure 550 pounds. Total depth of the Howell well is 5887 feet with 5½-inch casing set at 5560 feet and perforated at 5443½-50 feet.

Duval County: J. W. Gorman's Herbst 2, wildcat, 9 miles east of the town of Freer, is coring below 2960 feet in shale and sand after having made a drill-stem test above this depth, recovering 980 feet of oil along with 200 feet of mud, salt water and sand. The test was made at 2831-36 feet, after having cored sand showing oil at 2826-36 feet.

Tom Graham's M. I. Richardson 2, wildcat 12 miles northeast of Bruni in GB&CNG 3, is swabbing, trying for completion in sand at 1784-88 feet where a drill-stem test recovered 70 feet of oil and oil-cut mud in 46 minutes. Casing was set at 1784 feet, top of the sand, and total depth is 1788 feet.

Zavala County: Humble Oil & Refining Company's Ike T. Pryor 1, wildcat near the town of La Pryor, has cored sand showing oil but is having trouble getting a seat to hold for a drill-stem test. First test was attempted at 2724-50 feet, and the well was then cored to 2750-53 feet, recovering more sand with an oil odor. Next test was tried at 2746-53 feet, but seat failed here also and operators were preparing to try again at latest report.

The Texas Company is setting up rig for Van Cleve 2, northwest of the Van



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For additional information write to the Secretary, Board for Lease of University Lands, University Station Box 2125, Austin 12, Texas.

Cleve 1, discovery gasser completed last week.

Starr County: Lockhart & Davenport's Frank Zarsky 1, in the Lockhart Area, is coring below 3902 feet in sand and shale after a drill-stem test at 3532-45 feet showed 180 feet of oil and salt water and 10 feet of oil-cut mud. A sand with a slight odor of oil was recorded at 3564-66 feet.

Texas Gulf Coast

Extension of Needville Field Regarded Likely

British American Oil Producing Company's Ed Hurta 1, in southwestern Fort Bend County, is starting tests which may result in extending the Needville field nearly ½-mile west. It was drilled to total depth of 6852 feet, set 5½-inch casing at 6798 feet, but operators have not released perforation points for the first test. However, it should make a well from the 5200-foot horizon, having previously made a drill stem test at 5187-5201 feet, recovering 500 feet of pipe line oil.

Montgomery County: Pan American Production Company will make a Wilcox test in southern Montgomery County, the company's L. E. Posey 1 to be a 12,000-foot well in the John B. Richards Survey, 4000 feet east and slightly north from LaGloria Corporation's Grogan-Cochran 1 which opened the Pinehurst field, producing from Wilcox sand. This discovery, the only well drilled in the field, produces 150 barrels daily.

Trinity County: Navarro Oil Company will drill an 11,000-foot Wilcox sand wildcat 3 miles southeast of Saron townsite in Trinity County, but has not yet started operations. The well, Edward R. Bolton 1, will be located 660 feet from south and west lines of Block 88 in the Henry Bond Survey, in an area where the company had previously drilled a shallower dry hole, and where Magnolia Petroleum Company drilled 2 dry holes in 1942. Magnolia's William Cameron 1 had noncommercial showings of oil in sands around 5100 feet, 6300 feet, and 6700 feet, stopping at 7314 feet. The second well went to 7266 feet and set casing at 5800 feet for tests at 5700 feet in 3 sand sections, all of which showed water.

Liberty County: Gulf Oil Corporation's Kirby Lumber Company C-22, deep Wilcox test in the Cleveland field in the northwest corner of the county, is coring and drilling below 10,142 feet, in the Wilcox. It is now below the depth to which the C-21 well was carried, and is still in the broken shale and sand section showing gas and distillate. No tests have been run.

Chambers County: Sun Oil Company's J. E. Jackson 1, outpost 2690 feet southwest of the discovery well in the Jackson Pastures gas-distillate field, showed mostly salt water during the test through casing perforations at 8122-40 feet, and was scheduled to kill and squeeze off these holes before perforating higher in the section. Total depth is 8739 feet with casing cemented to bottom of the hole.

Sun Oil Company's Evans 1, outpost in the North Winnie area, recently opened by the company's Evans 1, is drilling below 8963 feet in shale but has not run electric logging survey. The

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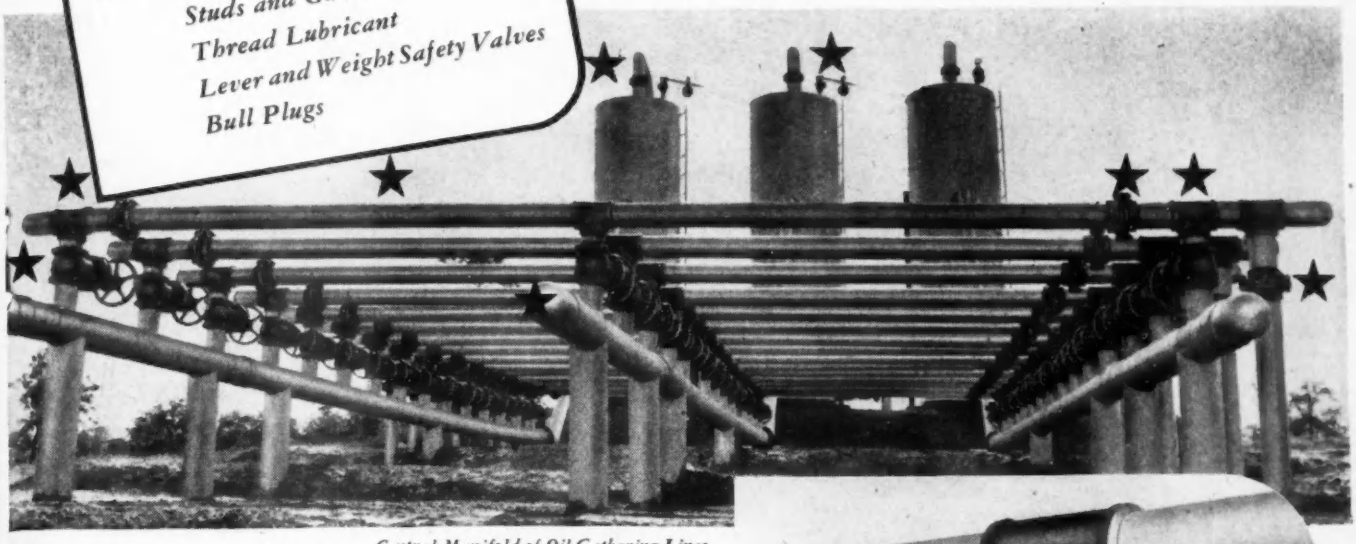

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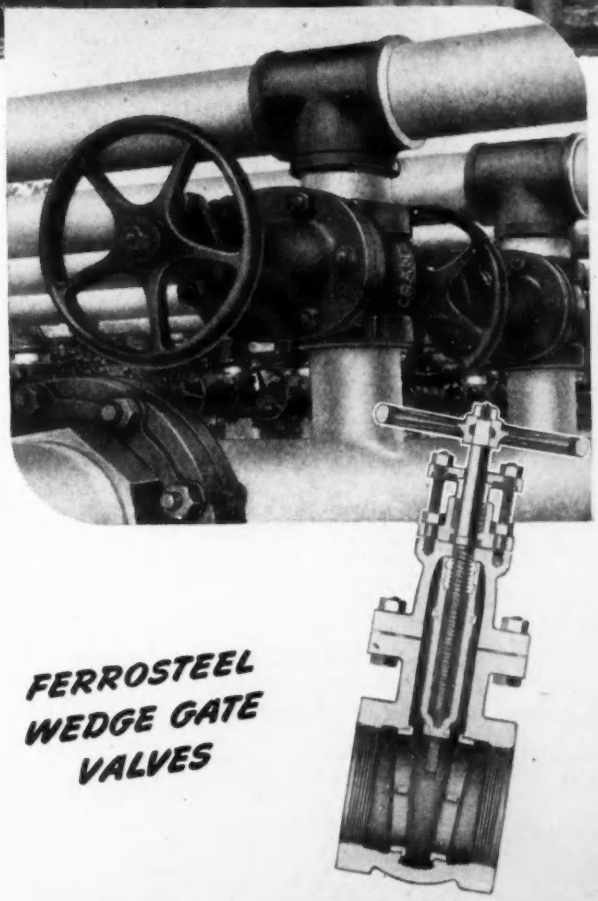

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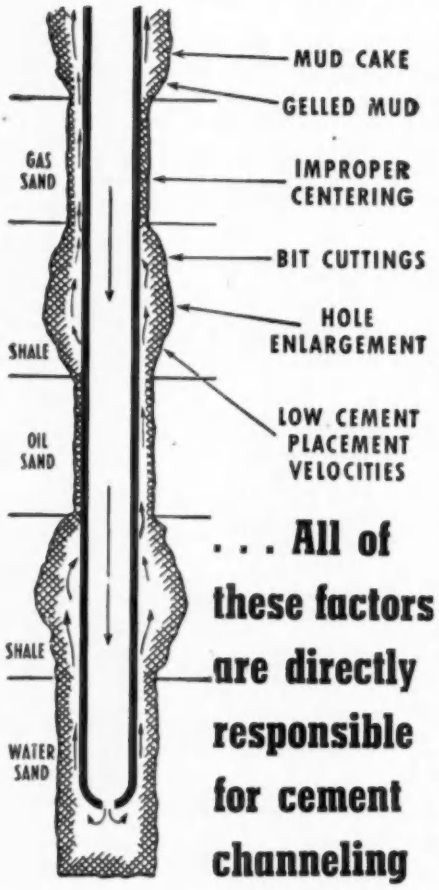

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discovery was completed through perforations at 8757-59 feet in Frio sand.

Fort Bend County: General Crude Oil Company's Warren Hill 1 will be a new ½-mile west outpost in the north part of the Thompsons field. Location is on the east 40 acres of the Hill lease in the H. Chriesman Survey, and 2655 feet west of H. M. Naylor's Shanks 3. It will go to 8000 feet to test the North Thompsons producing zone.

South Louisiana

New Deep Sand Opened in St. Martinville Field

Opening of a new deep sand 3000 feet north of production in the St. Martinville field, St. Martin Parish, may prove of considerable importance, promoting deep prospecting in the field with good chances of materially increasing reserves. This dome, discovered by Tide Water Associated Oil Company in 1935, has huge uplift although badly faulted, but producing area had been confined to two 5500-foot wells drilled by Tide Water Associated. These two wells had produced 1,348,629 barrels up to January 1, 1944. Continental Oil Company-Standard Oil Co. of Kansas' Standard of Kansas Fee 2, was still testing late in the week, trying to increase condensate production by installation of bottom-hole choke, after being completed through perforations at 9734-44 feet, but had already established some kind of production in deeper pays. On preliminary tests it flowed 20 barrels of 51.2-gravity condensate in 18 hours through a ⅛-inch choke with tubing pressure 3550 pounds and casing pressure 3750 pounds. At total depth of 10,042 feet, this is the deepest test for the field and the first to reach this sand. Continental and Standard of Kansas has acquired all of the Tide Water's Associated interest in this field.

Calcasieu Parish: Continental Oil Company is setting up rig for its second well in the recently discovered South Lake Charles field, Prairie Land & Canal Company 2, which will be 2310 feet south and west of the northeast corner of Section 2-11s-9w, 2640 feet east of the discovery well which produced 97 barrels of 53-gravity condensate daily from 10,410-420 feet.

Evangeline Parish: Gulf Refining Company's Schlicher-Thomas A-8, is running tubing for a production test expected to establish first production on the south side of Pine Prairie dome which would then be producing on all sides. Following tests starting near total depth of 10,669 feet, none of which showed anything, casing was perforated at 9272-80 feet and 9286-93 feet for a drill stem test. On 8-hour test, using 3/16-inch choke at top and ¼-inch at bottom, it recovered 49 barrels of 36.5-gravity oil, enough to establish the well as capable of commercial production.

St. Landry Parish: Sun Oil Company's Laurent Patin 1, south of discovery in the Cankton field, was brought in last week from perforations at 9710-20 feet, but after flowing for 3 hours on initial gauge, started showing salt water in varying amounts up to 40 percent, and was killed for a squeeze cement job. A new set of perforations was made at 9709-13 feet and the well is being tested again. One location south of the discovery well, it ran 38 feet lower on top of the sand.

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Michigan

Small Pumper, Two Good Discovery Prospects

H. L. Wadsworth et al's Peters 1, NW SW SW 32-9n-5w, Bloomer Township, Montcalm County wildcat, appears a good Traverse lime pool prospect after filling up and flowing in 4 hours after the pay was logged. Traverse was topped at 2605 feet with lime at 2633 feet. Well started to fill up at 2659 feet in open 6-inch hole and it flowed 4 hours later before a control head had been set. It died after blowing off the head and it has been shut in since waiting storage and casing.

Harold McClure of Alma, C. L. Maguire, Inc., of Mt. Pleasant, Aurora Gasoline Company of Detroit and Columbia Oil & Gas Company of Mt. Pleasant are jointly associated in the development. The test is 10 miles south of the Crystal field in Montcalm County.

Allegan County: Clifford Perry's Bieber 1, SE NW NW 4-4n-12w, Dorr Township, pumped from 5 to 9 barrels oil and 8 to 15 barrels water from Traverse lime pay at 1675-83 feet and has been completed as a small discovery pumper.

Wexford County: C. W. Teater's Wexford 1, NE NE NW 10-21n-9w, Wexford County, logged Dundee at 3836 feet and cored to 3842 feet with some oil-gas saturation showing. Casing was cemented at 3835 feet preparatory to completion with a spudder. This wildcat looms as the best pool opener prospect of 10 wildcats drilled in the general area over a period of 14 years.

Humble Shifts Men

The following changes in supervisory forces of the production department of Humble Oil & Refining Company recently were announced:

Homer McCarty was transferred from the Andrews district, Florey, Texas, to the Chalk district as district superintendent.

Ernest M. Bedford, district chief clerk, was transferred from Waynesboro, Mississippi, to Pointe-a-la-Hache, Louisiana.

John C. Gill, district chief clerk, was transferred from Geismar, Louisiana, to Waynesboro, Mississippi.

Ralph A. Watson, district petroleum engineer, formerly of Sugarland, Texas, was transferred to Lolita, Texas.

Samuel A. Barclay, Jr., was transferred from the Louisiana division office, New Orleans, to Paradis, Louisiana, as district petroleum engineer.

Frank Fee was transferred from Florey, Texas, to New Orleans, as district chief clerk.

☆

J. E. LINDROTH has been elected secretary of the executive committee, and assistant secretary of Standard Oil Company (New Jersey). He joined the company in 1919, and since 1933 has been assistant manager of the co-ordination department. A. C. Minton, secretary of the executive committee for the past 11 years, and also secretary of the company, will devote his full time to administrative matters in the latter post.

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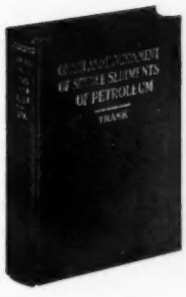

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WESTERN CANADA

Southeastern Alberta Plains Well Important

California Standard Oil Company's Conrad-Province 2, lsd 1 5-6-15w4, swabbed 180 barrels daily of 25-gravity black oil from Ellis (Jurassic) sand between 2960 and 2972 feet. Hole was drilled to 2960 feet and 7-inch casing set at 2960 feet. Considered an important strike on the Southeastern Alberta Plains, location is 21 miles southeast of the Taber field, and 12 miles southeast of the Imperial-British Dominion discovery at Conrad 1. Pump is being installed and estimated probable initial output runs as high as 150 barrels daily. Taber field and the Imperial-British Dominion well mentioned above produce 18-19-gravity oil from the Taber sand at the base of Lower Cretaceous, with water indicated in the Ellis. This condition is reversed in Conrad-Province 2, which showed nothing commercial in the Taber, and no water with the oil from the Ellis.

Princess-Steveville Syndicates No. 1, lsd 7 14-20-11w4, discovery well on Denhart Dome, 100 miles east of Calgary, has been placed on production, flowing 50 barrels of 25-gravity oil with 735,000 feet of gas, from Bow Island sand between 2520 and 2567 feet. The syndicate is rigging No. 2 in SWc lsd 2 14-20-11w4, 1320 feet south of No. 1, and plans to test Bow Island or proceed to 3300 feet to include Sunburst, Ellis and Madison formations.

Standard Oil Company of British Columbia and Nassau Explorations Ltd, plan a wildcat test at Taber-Province 87-15A, SWc lsd 13 15-9-17w4, three miles west of Standard-Nassau oil production, and a mile east and north of Major-Taber No. 1, which is being tested.

Duke to Drill

The Duke of Windsor (was King Edward VIII), with New York associates, has organized Ecushwa Oils Ltd to drill on the duke's ranch in the Southern Foothills of Alberta. Location has been made for the initial test in lsd 15 25-16-3w5, 9 miles south of the Turner Valley field, on the "Pekisko Hills Uplift" section of the Highwood Uplift, which flanks Turner Valley to the west and extends southward for several townships. That section of the uplift underlying the duke's 6¼-section ranch has been regarded by geologists as promising. The main structure consists of a series of small parallel anticlines, separated by synclines, with depth to the Madison lime on some highs known to be as shallow as 1000 feet. One such anticline is believed to underlie the east half of the ranch, on which the duke holds a 99-year lease on oil and gas, granted to him in 1930.

☆

L. P. CLINE has been placed in charge of the Tulsa office recently opened by Texasteel Manufacturing Company of Fort Worth.

☆

JACK BARTON has been appointed chief engineer and sales manager of Standco Brake Lining Company and Standco Bolt Company, Houston. Barton, a graduate of the University of Oklahoma, has been connected with the oil industry for the past 15 years, and has been with Standco Industries for 4 years.

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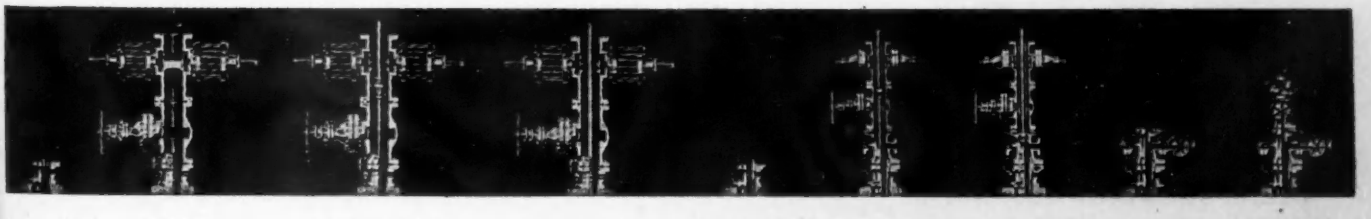

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Fresno County—Failure: Standard of California's Wells Fargo Bank 1, sw ne nw 30-21-15, Jacalitos area, Cretaceous 3225 ft, abnd 3361 ft.

Fresno County—Discovery: Tide Water Associated Oil Co.'s Jacalitos 27-16, ne sw sw 16-21-15, 2 mi s Coalinga, flow 1500 bbls 33-gr oil, 28/64-in, 200,000 gas, perf 3860-46, 3828-06 ft, oil sand 3563 ft, McLure 3563 ft, td 3885 ft.

Kern County—Failures: Bandini Pet. Corp.'s Bishop-Mills 7, se nw se 24-28-28, Round Mountain area, barren Vedder 2246 ft, abnd 2308 ft.

Signal Pet. Co.'s S.P. 2, se nw sw 25-28-28, Round Mountain area, barren Vedder 2803 ft, abnd 2813 ft.

Universal Cons. Oil Co.'s Sauer Dough 5, ne sw sw 23-29-21, Cymric area, Amnicola 1311 ft, abnd 1446 ft.

Chanslor Canfield Midway Oil Co.'s BF 11-24, sw sw sw 11-29-21, South Belridge area, wet, abnd 1375 ft.

Kern County—Discovery: Independent Exploration Co.'s Conoco 33, se nw nw 33-27-27, Premier area, pump 112 bbls 12.5-gr oil, 29 wtr, 80 ft perf ldd 2349 ft, td 2352 ft.

Los Angeles County—Failures: General Petroleum Corp.'s Comm. 14-1, sw nw sw 7-3-11, Norwalk area, abnd 7520 ft.

Seaboard Oil Corp.'s Park 1, ne se sw 9-1-13, Elysion Park area, abnd 2300 ft.

Shell Oil Co.'s Continental 86-20, 20-5-17, Loma Verde area, abnd 7006 ft.

Merced County — Failure: Shell's Wolfsen 61-3, ne nw ne, Los Banos area gas test, abnd 4484 ft.

San Joaquin County—Failure: Standard of California's Fairoaks Comm. A-1, sw sw ne 19-1-7, Stockton area gas test, abnd 6500 ft.

Santa Barbara County—Failure: Richfield Oil Corp.'s Escolle 1, 20-9-34, Casmalia area, oil sand 3268 ft, Lospe 4047 ft, abnd 5808 ft.

ILLINOIS WILDCATS

Clinton County—Failure: Wiser Oil et al's McAdams 1, sw nw sw 21-3n-1w, abnd 1390 ft.

Edwards County—Failure: Morris' Crowder 1, nw nw ne 16-2s-10w, abnd 904 ft.

Effingham County—Failure: Carter's Scott 1, nw ne ne 20-9n-4e, abnd 2010 ft.

Franklin County—Failure: Aetna Oil et al's U. S. Coal & Coke 1, sw nw sw 21-6s-4e, abnd 3165 ft.

Hamilton County — Failure: Nat'l Assoc. Pet.'s Johnson 1, nw sw se 10-5s-7e, abnd 3457 ft.

Jefferson County—Failures: Skelly et al's McNabb 1, nw ne se 34-4s-1e, abnd 2953 ft.

Kingwood Oil et al's McKeene 1, sw se sw 14-4s-4e, abnd 3494 ft.

Marion County—Failure: Texas Co.'s Carlisle 1, se ne sw 9-3n-3e, abnd 2568 ft.

Perry County—Failure: Magnolia's Reuschey et al 1, nw se sw 11-7s-4w, abnd 3582 ft.

Richland County—Failure: Frazier's Schlichennyer 1, nw se se 19-3n-10e, abnd 3197 ft.

Shelby County—Failure: Lynch's Amling 1, ne ne nw 20-12n-2e, abnd 1679 ft.

White County—Failures: Kubat's Strum 1, ne sw ne 1-4s-10e, abnd 3192 ft.

Allied Oil Co.'s Pierce 1, nw nw sw 11-7s-10e, abnd 2988 ft.

KANSAS WILDCATS

Barton County — Failure: Lindas et al's Klepper Estate 1, ne se 7-20s-12w, Lans 3191 ft, Arb 3443 ft, abnd 3492 ft.

Dickinson County—Failure: Westgate et al's Lockhart 1, ne se 11-16s-2e, chat 2379 ft, abnd 2418 ft.

Kiowa County—Failure: Vierson & Cochran's Johnson 1, nec se 22-28s-18w, Kind 4925 ft, Vi 5015 ft, Simp 5166 ft, Arb 5272 ft, abnd 5328 ft.

Pratt County—Failure: Phillips' Levick 1, sw sw nw 29-28s-13w, Lans 3930 ft, Miss 4316 ft, Simp 4487 ft, Arb 4566 ft, abnd 4580 ft.

Rooks County—Failure: Appleman's Poague 1, sec 27-10s-20w, Vi 3720 ft, Arb 3778 ft, abnd 3820 ft.

Rush County—Failure: Wolf Creek's Carman 1, se nw ne 25-16s-20w, Lans 3496 ft, Arb 3862 ft, abnd 3962 ft.

Saline County—Failure: Barbara Oil's Cussick 1, ne se ne 33-13s-1w, Hunton 2935 ft, Vi 3180 ft, Arb 3370 ft, abnd 3400 ft.

Shawnee County—Failure: Skelly's Meyer 1, nw se sw 13-10s-13e, Simp 2997 ft, Arb 3067 ft, abnd 3147 ft.

Stafford County — Failures: Helmerich & Payne et al's Jons 1, se se ne 35-23s-13w, Lans 3470 ft, Vi 3831 ft, Arb 3957 ft, abnd 4000 ft.

Faulkner's Russell 1, se sw nw 33-24s-13w, Lans 3628 ft, Vi 4040 ft, Simp 4167 ft, Arb 4219 ft, abnd 4240 ft.

KENTUCKY WILDCATS

Muhlenberg County—Failure: Hobson et al's Allison 1, 13-G-28, abnd 800 ft.

Union County — Failure: Yingling's Slack Heirs 1, 20-P-18, abnd 3063 ft.

SOUTH LOUISIANA NEW PAY

Acadia Parish—Egan Discovery: Sun's C. J. Freeland et al 1, 665 w 656 n of sec 29-9s-1w, ne of prod, perf 10, 765-75 ft, flow 502.2 bbls 35.6-gr, 1/264-in, 690/1 td 10,796 ft.

SOUTH LOUISIANA WILDCAT

Iberville Parish—Discovery: Humble's Adam Hymel et al 1, start nwc sect 91 go nely alg nwl 800 th se at ra 470 in 91-10s-13e, perf 170 shots 10,688-705 ft, flow 115 bbls 49.5-gr oil, 5,650,000 gas, ¼-in, td 10,846 ft.

MONTANA WILDCATS

Glacier County — Failure: Hannah-Porter's Marceau 1, nw se nw 3-31n-6w, sw Cut Bank, Ellis 3092 ft, Madison 3238 ft, td 3284 ft, pb & abnd Cut Bank 3087-3092 ft.

Pondera County — Failures: A. B. Cobb & Co's Hirshberg 1, ne ne sw 23-27n-4w, Devonian 2935 ft, Cambrian 3994 ft, td 5288 ft, pb and abnd Ellis-Madison, 2018-2026 ft.

Texas Co's Schelpp 2, sw ne se 22-27n-2w, Brady Block, Sunburst 1461-1467 ft, abnd 1486 ft.

Teton County — Failure: Roy G. Anderson's Hanson 1, nw nw nw 21-27n-6w, West Pendroy, Sunburst 3150-3175 ft, Ellis-Madison 3513 ft, abnd 3537 ft.

WYOMING OUTPOST

Park County — Extension: Carter's Johnson 1, ne ne se 6-57n-99w, Elk Basin field, Tensleep, pump 54 bbls oil, 96 bbls wtr, Ten-Sleep td 5963 ft.

OKLAHOMA WILDCATS

Cleveland County—Oil Discovery: Mid-Continent's Westermier 1, ne sw sw 26-10n-3w, perf 95 shots 8830-70 ft, flow 332 bbls, 14/64-in, td 8902 ft.

Creek County — Oil Discovery: Ashland Refg's Mills 1, ne se se 35-15n-9e, perf 20 shots 2422-31 ft, pump 90 bbls 34-gr, td 2403 ft.

Garvin County — Failure: Stanolind's McPherson 1, nw nw se 27-4n-1e, 1st Bro. sd 4314 ft, 2nd Bro. sd 4415 ft, abnd 4455 ft.

Jefferson County — Gas Discovery: Sohio's Ridgeway 1, sw ne se 17-3s-4w, perf 46 shots 1628-34, 48 shots 1602-10, 12 shots 1586-90 ft, flow 4,920,000 gas, td 1684 ft.

Kay County — Gas Discovery: Jenkins' Fee 1, se se nw 3-25n-2w, Miss chat 4355 ft, flow 9,000,000 gas, td 4375.

Logan County — Failure: Wood Oil's Haver 1, se ne 11-16n-1e, Hunt 4810 ft, Vi 5045 ft, 1st Wx 5117 ft, 2nd Wx 5252 ft, abnd 5274 ft.

Oklahoma County — Oil Discoveries: Anderson-Prichard's Crookham 1, nw se 9-13n-4w, perf 300 shots 6865-6910 ft, 1000 gals acid, flow 157 bbls oil, 1 hr 146 bbls, oil 2nd hr, 151 bbls oil 3rd hr, 141 bbls oil 4th hr, 1-in. tbg ch, pinched to 200 bbls, td 6948 ft.

Jordan's Williams 1, sw se sw 11-14n-1w, perf 5980-97 ft, flow 1330 bbls oil, td 5997 ft.

Phillips' Gomer 1, sw nw 16-14n-4w, perf 6660-6730 ft, 1000 gals acid, flow 400 bbls, 1/2-in td 6746 ft.

Caddo County—Failure: Stephens' Lawrence 1, sw se 21-7n-9w, Medrano 9556 ft, abnd 9663 ft.

Grant County—Failure: Northern Ordnance's

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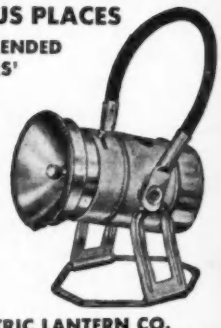

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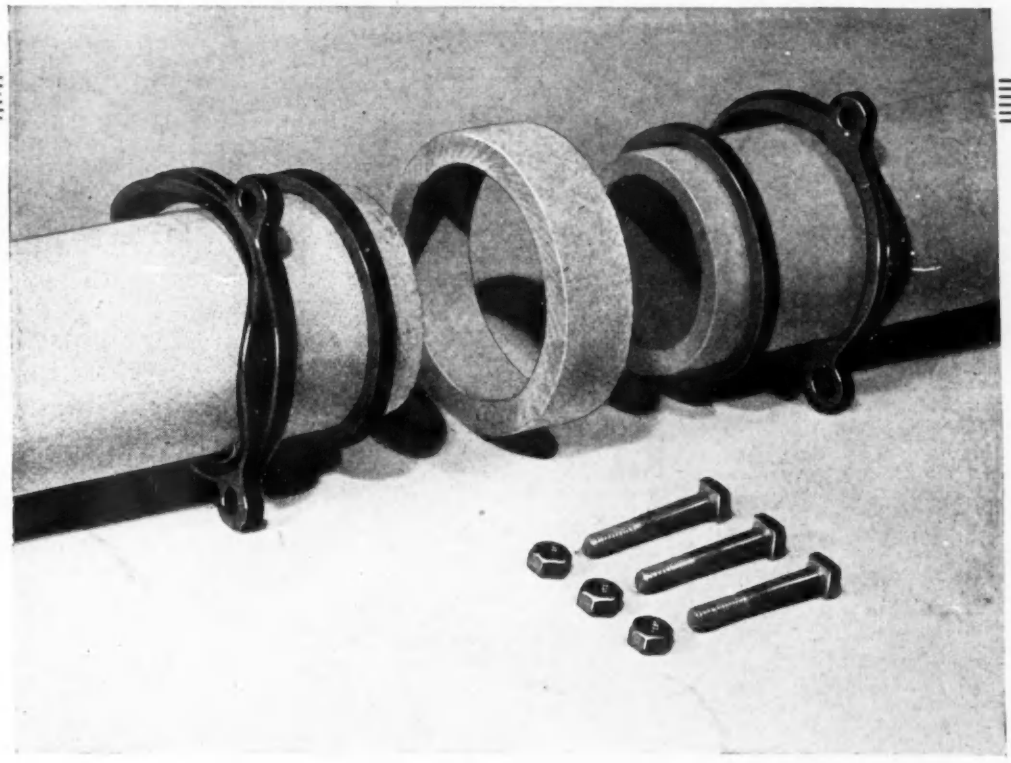

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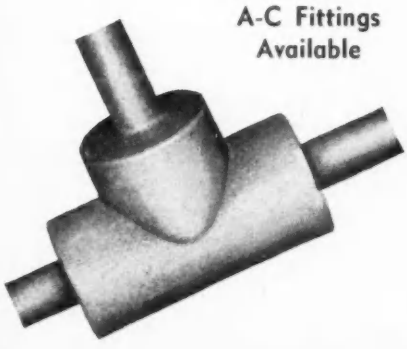

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■ Research Geophysicist with several years experience preferably including field work and laboratory work, to engage in research geophysics with major oil company. In charge of work including evaluation of new ideas and experimental development of some. Position offers good future. Give full personal data, experience and salary desired. Our employees know of this advertisement. All answers strictly confidential. Address: Box 63, c/o The Oil Weekly, Houston, Texas.

■ MAN with geological or geophysical training and experience, wanted for foreign exploration and development work with large oil company. Give age, educational background, experience and marital status. Address: Box 62, c/o The Oil Weekly, Houston, Texas.

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SITUATIONS WANTED

■ PETROLEUM GEOLOGIST: B.S., M.A., Ph.D., several years experience, thoroughly familiar with Gulf Coast Geology, desires position with strong independent operator or major oil company. State maximum salary and full particulars in first letter. Address: Box 68, c/o The Oil Weekly, Houston, Texas.

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Whitworth 1, nw ne se 4-25n-3w, Misener 5309 ft, 1st Wx 5352 ft, 2nd Wx 5397 ft, abnd 5410 ft.

Oklahoma County—Failure: Atlantic's Wickens 1, se se se 13-12n-1w, 1st Wx 6193 ft, 2nd Wx 6302 ft, abnd 6321 ft.

Stephens County — Discovery: Texas Co.'s Cooper 1, sw sw sw 16-2n-8w, perf 60 shots 5340-55 ft, perf 336 shots 4743-85 ft, flow 9,283,000 gas, td 5360 ft, pb 5290 ft.

WEST TEXAS WILDCAT

Borden County — Failure: Northern Ordnance's Clayton-Johnson 1-A, sw sw se T&P Ry. 13, blk 32, T-4-n, elev 2475 ft, anhydrite 1070 ft, San Andres 2985 ft, abnd 3346 ft.

WEST CENTRAL TEXAS WILDCATS

Jones County — Failure: Geochemical Surveys', Gustafson 1, 1050 snl 2150 wel H&TC Ry. 8, blk 4, elev 1618 ft, abnd 4680 ft.

Shackelford County — Failure: Ungren & Frazier's Reves 1, sw sw se H&TC Ry. 14, blk 3, abnd 3266 ft.

Stephens County—Oil Discovery: Northern Ordnance's S. P. Robertson 1, 1000 nsl 330 ewl TE&L Co. sec 1142, 1¼ mi se Crystal Falls, elev 1117 ft, Bend 3221 ft, flow 101 bbls 42-gr, ¼-in, 500 gals acid Bend 3222-36 ft.

Taylor County—Failures: Bailey Balkan et al's Hamilton 1, 400 snl 2600 ewl T&P Ry. 34, blk 16, elev 1760 ft, abnd 2486 ft.

Brown-Hancock Oil Co. - E. J. Keough's Middleton 1, 660 e 660 s of swc W. Forester 148-ac, blk 4, in sec 3, W. F. Sparks sur No 509, elev 1973 ft, abnd 3109 ft.

WEST CENTRAL TEXAS NEW PAY TEST

Palo Pinto County — Failure: Darby Pet. Corp.'s Costello 1, 3300 ewl 660 nsl of Michael Castleman sur A-119, Ellenburger 4748 ft, abnd 4848 ft.

SOUTH CENTRAL TEXAS WILDCATS

Bexar County—Failure: J. A. Caldwell's Stanfield 1, 740 e of Foster Rd, ½ mi s of Conaway 1, abnd 580 ft.

Wilson County—Discovery: H. A. Rice's Er. S. C. Scull 2, 800 fr nl 3500 fr wl 1695-ac tr sect 8, Manuel Ximinez Gr, Lavernia area, elev 477 ft, sand 1467-92 ft, pump 5 bbls, tf 1492 ft.

SOUTHWEST TEXAS WILDCAT

Webb County—Failure: Magnolia's Garcia-Arriba 4, 3450 fr el 330 fr sl 2654-ac lse, J. James subdvn, Albercas de Arriba Gr, 5300 ssw of No 3 dry hole, abnd 3076 ft.

LOWER TEXAS COAST WILDCATS

Jackson County—Failures: Ray Reynolds-Roxie Wright's O. S. York et al 1, 467 fr swl 926 fr swl 129.3-ac lse, W. D. Sutherland sur A-76, abnd 6915 ft.

Butcher-Arthur-Salt Dome Corp's J. W. Young Est. 1, 330 fr nel 330 fr sel 280-ac lse, W. J. E. Heard Lge A-31, abnd 6586 ft.

Karnes County—Failure: Magnolia's Russell-Atkinson 2, 660 fr nw 660 fr swl 1240-ac lse, Carlos Martinez Gr, abnd 6825 ft.

Live Oak County—Failure: R. P. Brewer-Newman Bros. Drlg. Co.'s Natalia Meirath et al 1, 467 fr nw&swl 250-ac lse, SK&K sur 249, cored Pettus dry, abnd 4500 ft.

LOWER TEXAS COAST OUTPOST

Karnes County — Hondo Creek Extension: Phillips' C. L. V. Reasoner 1, 660 fr sl 1228 fr el 106-ac lse, Carlos Martinez Gr A-6, 990 ese No 1 Reasoner, sand 6574 ft, perf 60 shots 6574-89 ft, flow 160 bbls 50.5-gr, 9/64-in, td 6868 ft, pb 6600 ft.

TEXAS GULF COAST WILDCATS

Brazoria County — Failure: Continental's Ramsey State Prison Farm 1-A, 990 fr el 330 fr sl A lse 17,300 e 1200 s of nwc S. Richardson sur A-22, Lochridge area, abnd 9310 ft.

Grimes County — Failure: Northern Ordnance's J. M. Quinn 1-B, 330 fr s&wl 40-ac lse, and blk 14, S. F. Austin sur, abnd 3850 ft.

EAST TEXAS WILDCATS

Robertson County—Failure: Hamman Exploration Co.'s Gibson 1, 1700 ft ne alg sel 653.33-ac por of 1825-ac lse fr swc, th 1000 nw at ra, Jesse Webb sur, elev 292 ft, Midway 975 ft, Navarro 1542 ft, Taylor 2198 ft, Pecan 2849 ft, Austin 3935-4123 ft, Woodbine 4380 ft, Buda 4464 ft, Del Rio 4526 ft, Georgetown 4577 ft, Edwards 4827 ft, abnd 5022 ft.

Rusk County—Failure: H. C. Owens et al's Smith Patrick 1, 1050 fr m/n/sl 600 fr m/e/el Daniel Woodland sur, elev 414 ft, Austin chalk 3010-20 ft, abnd 3052 ft.

Titus County—Failure: Ryan Consolidated Pet. Corp.'s Smith 1, 1054 wel 2900 nsl Benjamin Clark sur, elev 371 ft, Pecan 2000-2525 ft, Blossom 2700 ft, Sub-Clarksville 3350 ft, Woodbine 3785 ft, Georgetown 4135 ft, Paluxy 5040 ft, abnd 5309 ft.

Van Zandt County—Failure: A. F. Richardson et al's Turner 1, 467 snl 575 wel of 66-ac lse, and J. E. Moore sur No 41, elev 452 ft, Nacatoch 1828 ft, Pecan 2705 ft, Austin 4044-4430 ft, Woodbine 4975 ft, abnd 5010 ft.

EAST TEXAS NEW PAY TESTS

Henderson County—Opelika New Deep Pay: Lone Star Producing Co. (was Tide Water-Seaboard's) McElreath-Suggett 2-C (OWDD) 467 ft out sec of 149-ac tr, W. P. Wyche sur, original gas- distillate disc for area, otd 9320 ft, elev 452 ft, Pettit 8510 ft, Travis Peak

9073 ft, sandstone 9186 ft, est 30,000,000 gas, 55 bbls dist per million, open flow fr Pettit perf 8845-8907 ft and Travis Peak open hole 9194-9351 ft, original gas-distillate zone from perf 7910-50 ft in Rodessa to be used for dry gas injection, td 9351 ft.

Wood County—Manziel Deep Pay Discovery: Shell's Whatley 1, 467 ewl 769 snl of 99.09-ac lse, John Polk sur, elev 461 ft, Goodland 6208 ft, Glen Rose 6672 ft, massive anhydrite 7882-8061 ft, Pettit 8760-68 ft, pump 40½ bbls 43-gr, 21,500 gals acid via Rodessa perf 8455-8505 ft, td 9005 ft.

NORTH TEXAS WILDCATS

Archer County—Failure: D. H. Bolin et al's Thomas 1-A, 466 nsl 600 ewl of J. R. Blessings sur A-976, abnd 1421 ft.

Wilbarger County—Failure: Joe A. Worsham et al's Lewis 1, c nw ne H&TC 10, blk 9, abnd 3160 ft.

Young County—Oil Discovery: Burk Royalty Co.'s Stovall 1, 330 out nwc TE&L Co. sec 495, elev 1094 ft, Marble Falls 4352 ft, flow 355 bbls 40-gr, natural, 3/8-in, sand 4352-70 ft.

WYOMING WILDCAT

Hot Springs County — Discovery: Pioneer Oil Corp.'s Unit 1, c ne sw 12-45n-97w, Golden Eagle, flow 250 bbls 58-gr dist, 3,500,000 gas, tbg ch, fr muddy sd 6724-6770 ft on 12-hr test, est 80 bbls hr on open test, td 6776 ft.

WESTERN CANADA WILDCAT

Southern Alberta Plains—Taber: Mid-Continent Oil & Gas-Standard of B. C.'s Mid-Continent 5, lsd 11 35-7-16w4th, abnd 3303 ft.

United States Wildcat Starts

CALIFORNIA

Kern County: Anderson, Giffen & Anderson's Durnal 1, se sw se 24-27-28, Mount Poso area, mim.

Shell Oil Co.'s 37-25, corehole, ne sw sw 25-27-19, North Belridge area, lcn.

Los Angeles County: Richfield Oil Corp.'s Leuzinger 1, se sw sw 8-3-14, El Segundo area, lcn.

Shield Petroleum Co.'s 1, near intersec Hill St. and Overland Ave., Inglewood area, rig.

Madera County: Union Oil Co.'s Pacific Lands Co. 1, corehole, sw sw sw 35-11-18, Madera area gas test, mim.

Sacramento County: Capital Co.'s 2, se se se 27-5-5, Thornton area gas test, mim.

San Bernardino County: Lee Salter's 1, nw ne ne 34-4-5, Hisperia area, lcn.

San Diego County: La Jolla Pet. Co.'s La Jolla 1, 32-15-3, Waterman area, lcn.

Santa Barbara County: Union Oil Co.'s McNee 3, corehole, ne ne se 20-9-32, East Cat Canyon area, mim.

Ventura County: Wilshire Oil Co.'s Petit 2, 9-3-20, South Mountain area, lcn.

ILLINOIS

Clinton County: Texas Co.'s Grappenhouse 1, nw nw ne 8-3n-4w, lcn.

Effingham County: Nation's Bergman 1, ne ne ne 31-6n-4e, dr 374 ft.

Franklin County: Adkins' Peabody Coal et al 1-C, se se se 9-7s-3e, lcn.

Hamilton County: Nat'l Assoc. Pet.'s Johnson 2, ne sw se 10-5s-7e, lcn.

Jefferson County: Oberling's Maxey Comm. 1, se sw sw 18-2s-3e, lcn.

Lawrence County: Cannon's Woodyard 1, sw sw nw 10-2n-12w, lcn.

Texas Co.'s Van Gilder 1, sw sw ne 21-3n-13w, lcn.

Texas Co.'s Smith 1, se se ne 16-4n-13w, lcn.

Madison County: Barton's Blunt 1, ne ne ne 15-3n-5w, lcn.

Montgomery County: Northern Ordnance's Bohan 1, nw se 18-8n-4w, dr 277 ft.

Northern Ordnance's Adams 1, ne se 28-8n-4w, lcn.

Northern Ordnance's Covert 1, ne sw 35-8n-4w, lcn.

Northern Ordnance's Likely 1, nw nw 1-9n-5w, dr 468 ft.

Northern Ordnance's Pendarvis 1, nw nw 17-9n-4w, dr 117 ft.

Northern Ordnance's Tubbs 1, nw nw 22-9n-4w, dr 189 ft.

Randolph County: General O & G Syndicate's Schnoll 3, sw ne sw 27-4s-7w, lcn.

Richland County: Pure's McBride 1, sw se se 16-3n-9e, dr 224 ft.

Shelby County: Tharpe et al's Hostetler 1, se nw nw 33-11n-4e, lcn.

St. Clair County: Skelly's Schickedang 1, ne se nw 12-3s-6w, lcn.

Wabash County: Fox et al's Woodyard Est 1, ne se se 33-2s-13w, dr 226 ft.

Fox et al's Thompson 1, sw sw sw 3-3s-13w, lcn.

Washington County: McBride's Jasper 1, sw se nw 11-2s-3w, lcn.

White County: Sohio's Union Central Life 1-A, se ne nw 10-7s-10e, lcn.

INDIANA

LaPorte County: Vaughn's Zahn 1, nw ne nw 14-33n-4w, lcn.

Wells County: Redwine et al's Gahman 1, sw se sw 8-27n-13e, lcn.

KANSAS

Butler County: Marlyn's Doyle 1, se se nw 22-29s-5e, dr 385 ft.

Ellis County: Stanolind's Byers 1, ne nw 24-12s-18w, rur.

Bridgeport's Strecklein 1-A, sec ne 13-14s-18w, lcn.

Harvey County: Wolf Creek et al's Schrag 1, nwc sw 5-22s-2w, lcn.

Hodgeman County: Continental's Gleason 1, se ne nw 5-24s-21w, dk.

Kingman County: Phillips' Kuhns 1, sw sw nw 3-27s-7w, lcn.

Rice County: Omar Drlg.'s Stout 1, sw se sw 8-21s-9w, dr 50 ft.

Sedgwick County: Phillips' Kellogg 1, ne ne se 36-25s-3w, lcn.

NEW MEXICO

Lea County: Skelly's State 1-X, c nw nw 9-21s-34e, machine for 4500-ft test.

Texas Co.'s D. D. Swearingin 2, c sw ne 9-20s-34e, rig.

OKLAHOMA

Atoka County: Wakefield & Palmer's Zweigel 1, ne sw nw 16-3s-10e, lcn.

Bryan County: Atlantic Rfg. Co.'s Brown 1, nw nw se 16-8s-8e, lcn.

Creek County: Cotton's Lindsey 1, se se se 33-15n-7e, lcn.

Comanche County: Texas Co.'s Weaver 1, sw sw se 19-4n-10w, lcn.

Hughes County: Bartlett et al's Smith 1, nw se ne 27-6n-8e, lcn.

Creekmoore-Rooney's Parks 1, sw sw ne 3-8n-10e, c&p.

Texas Co.'s Nichols 1, se sw sw 33-9n-10e, mit.

LeFlore County: LeFlore County Gas & Elec. Co.'s Schumann 1, ne se 3-8n-26e, mim.

Logan County: Davon Oil Co.'s Chittwood 1, sw sw 15-16n-4w, dr 350 ft.

Marshall County: Texas Co.'s Mounds 1, se sw se 23-6s-5e, lcn.

Okfuskee County: Okla Oil et al's Jone 1, nw se 12-13n-8e, rig.

Hall's Irons 1, nw se 32-10n-12e, lcn.

Canadian County: General Oil Co.'s Rice-Finch 1, sw nw se 14-13n-7w, sd.

Creek County: Nadel & Gussman et al's Sandlin 1, se se nw 6-14n-8e, dr 1250 ft.

Noble County: Barnsdall Oil's State 1, sw se nw 13-21n-1w, dr 1580 ft.

British-American's School 1-F, se ne nw 13-21n-3e, rur.

Okfuskee County: Wilcox Oil's Julsom 1-A, nw nw nw 15-12n-10e, dr 2910 ft.

Texas County: Phillips Stookey 1, nw nw se 30-1n-14ecm, lcn.

WEST TEXAS

Concho County: Anzac Oil Corp's G. R. White 1, 440 ft out swc J. H. Huey sur No 4, lcn 1800-ft test.

Glasscock County: Richfield Oil Corp.'s S. N. Woody 1, c se T&P Ry. 9, blk 36, T-3-S, lcn 6000-ft test.

Lynn County: Phillips' Bartley 1-a, 633 ft snl 673 ft ewl E. L. & R. R. Co. 1372, blk 1, 50 ft n of 4285-ft jkd test, rur for 7000-ft test.

Upton County: Magnolia's American Republics Corp. 1, c nw nw T&P Ry. 8, blk 40, T-5-S, lcn 6500-ft Clear Fork test.

Yoakum County: Skelly's W. S. Hodges 1, c nw nw sec 446, blk D, J. H. Gibson sur, lcn 7800-ft Clear Fork test.

WEST CENTRAL TEXAS

Callahan County: Thos. D. Humphrey's J. E. Scott 1, 330 ft out of nec 130-ac lse, S. P. Ry. Sec 2, blk 1, lcn 4500-ft test.

Stephens County: Humble's W. H. Green 1, c sw ne sec 13, J. Conner sur A-43, lcn 5000-ft Ellenburger test.

Taylor County: Drilling & Exploration Co.'s J. S. Hutson 1, 330 out of nwc n 40-ac of 108-ac tr, labor 12, Lge 147, Grimes CSL sur, lcn 6000-ft Ellenburger test.

SOUTH CENTRAL TEXAS

Guadalupe County: Wiegand Bros.' Paul & Emma Baumert 1, 330 fr sw&nwl 227-ac lse, Matthew Besore sur, 2 mi s of Kingsbury, lcn 2500-ft Edwards lime test.

SOUTHWEST TEXAS

Jim Hogg County: M. L. Massengill-W. E. Spice's J. H. Allen & C. W. Hellen 2, 380 fr nl 30 fr wl H&GN sur 23, elev 789 ft, dr 1200 ft.

Zavala County: Humble's Ike T. Pryor 1, 660 fr sel 1980 fr swl sect 44 subdvn 1, Pedro Jose Aguirre Gr, dr 1211 ft.

Texas Co.'s Van Cleve 2, 3500 fr sl 1800 fr swc 660 fr el 633-ac lse in sect 597, 5700 n&w of No 1 gas disc, lcn.

LOWER TEXAS COAST

Hidalgo County: Seaboard of Delaware's Boston-Tex. Land Trust Co. 3, 13,300 fr el

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22,600 fr sl 22,496-ac lse, Los Guages & Los Maguelles Grs, lcn 6500-ft test.

Jackson County: Humble's C. Swanson et al 1, Mayo nw outpost 467 fr se&swl 181-ac lse, F. Menefee sur A-51, lcn.

TEXAS GULF COAST

Hardin County: Sun's Merchant Est. 1, 330 fr nl 1632 fr wl Minerva-Merchant 200-ac subdvn c lot 79, 125-ac lse, S. Jackson Lge, Sour Lake area, elev 46.2 ft, lcn 8000-ft test.

Jefferson County: Butcher-Arthur et al's Security Bank & Trust Co. 1, 660 fr n&wl 780-ac lse, and sect 69, T&NO sur A-215, elev 54 ft, lcn 10,000-ft test.

EAST TEXAS

Houston County: John S. Ivy-W. T. Moran's G. M. Murray & Sons 2, 1980 wel of 2000-ac lse, John Durst sur 5250 ne of Murray 1, abnd in Midway at 5492 ft, rur for 10,000-ft test.

Robertson County: Hamman Exploration Co.'s K. Noris 1, start swc of 179.6-ac site th 1600 e alg sl A. Jesse Webb sur th 330 n at r/a, 6 mi w of Calvert, mim for Edwards test.

NORTH TEXAS

Archer County: D. Houston Bolin et al's Harris 2, 1203 snl 900 ewl of blk 76, J. W. Harris subdiv, lcn 1400-ft test.

Clay County: Continental's E. W. Reynolds 1, 330 nsl 990 wel blk 14, Marion CSL sur, A-308, lcn 6500-ft Ellenburger test.

Cooke County: E. R. Perkins-A. H. Harmon's F. J. Becker 1, 2432 snl 330 ewl of blk 1, W. Oldham sur A-800, lcn 2800-ft Ellenburger test.

WESTERN CANADA

Alberta Foothills—Perisko Hills: Ecushwa Oils Ltd. 1, c lsd 15 25-16-3w5th, lcn.

Southern Alberta Plains—Taber: Standard of B. C.-Nassau Explorations' Taber-Province 87-15A, sw lsd 13 15-9-17w4th, dr.

Denhart Dome: Princess-Steveville Syndicate's No 2, sw lsd 2 14-20-11w4th, ru.

Alberta Foothills—Folding Mountain: Anglo Canadian - Home Oil - Imperial Oil's Jasper Syndicate 1, lsd 2 19-49-26w 5th, ru.

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Backwoods Diplomacy

"Have you ever been lost in the woods?"

"Nope—I was bewildered once for four days."

Practice What You Preach

"Son, fetch the old horse."

"Why the old one, father?"

"My motto is: Wear out the old one first."

"Then you fetch the horse."

Final

"May I have the last dance with you?"

"Big boy, you just had it."

It's All a Game

"Don't judge a married woman too harshly because she flirts with the butcher."

"And why not?"

"Oh, she may just be playing for larger steaks!"

Should Know

"When you asked her to dance, did she accept quickly?"

"Did she? Why, she was on my feet in an instant."

At the U.S.O.

"I hear June's marrying a second lieutenant."

"Yeah, the first one got away."

Cause for Grief

"And how's George?" referring to an old friend known to both of them.

"Oh, he's dead long, long ago, and I shall never cease to mourn him."

"I never knew you had so much respect for him as all that."

"It weren't the respect I had for him, but, you see, I married his widow."

Poor Service

Two men were going through a house that was said to be haunted, when to their surprise they heard voices saying:

"Go away! Leave us alone! Go away!"

The men turned to each other nervously. "How is it we can hear them but can't see them?"

"Because," said the moaning voice of the ghosts, "our sheets haven't come back from the laundry."

Due for Pension

"Yes, she's an old family retainer."

"But you've only had her a few weeks."

"Yes, but these days two weeks is a long time to keep a servant."

Prize Package

"So you have a stenographer at last."

"Yes, and she's the most willing worker I ever had."

"Can she spell? Is she good on taking shorthand?"

"No, in fact, she just doesn't do any of those things well. But she does all the errands my wife tells me to do while she's gone for lunch and never complains at all."

Potent Apparel

A lady tourist was stopped at the border by a customs officer, who inquired the contents of a trunk she carried in the back of her car.

"Oh, that," she replied airily, "that's just some clothes."

Becoming suspicious, the official searched the trunk and found a dozen bottles of brandy.

"Do you call that wearing apparel?"

"Certainly, those are my husband's night-caps."

Heard at Camp

"Do you ever have trouble with that parachute?"

"Yes, once when I jumped I came down in a place marked, 'Keep Off the Grass.'"

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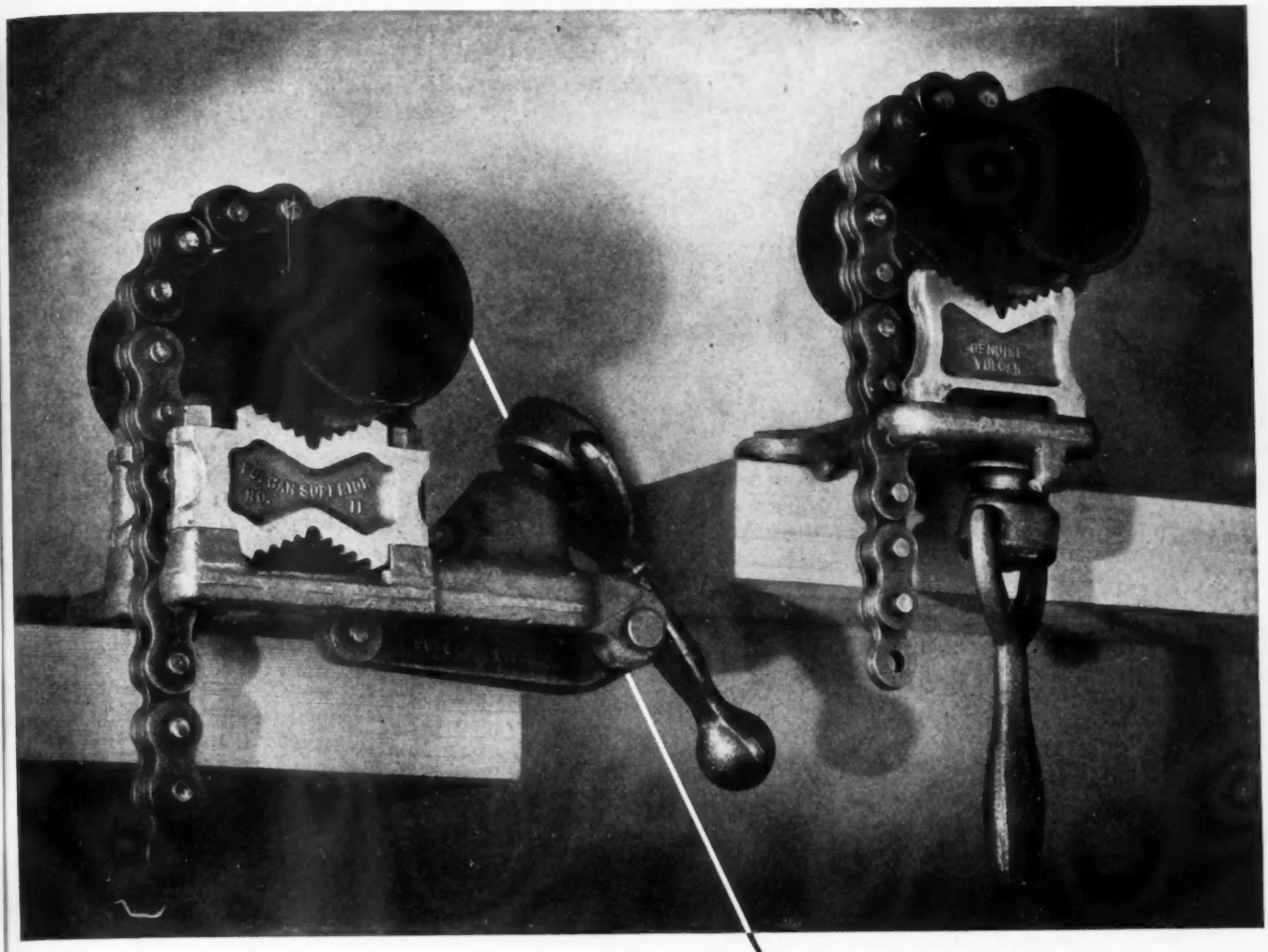

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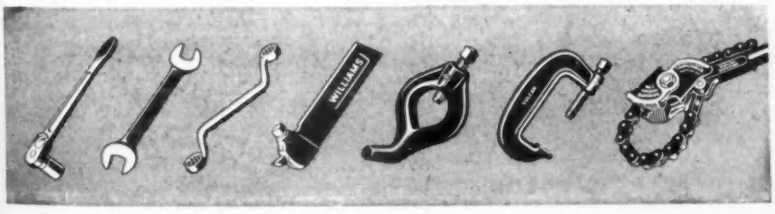

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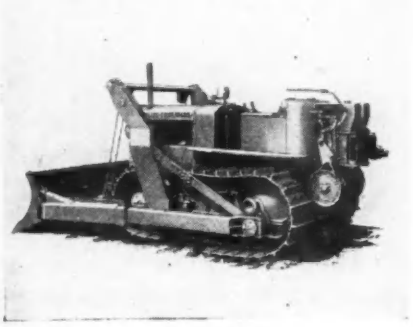
Bulldozer and Trailbuilder

THE BUCKEYE TRACTION DITCHER COMPANY

The Buckeye Traction Ditcher Company, Findlay, Ohio, has developed a new cable-controlled side-lift bulldozer and trail-builder featuring single king pin mounting of the moldboard and double trunnion tilting.

The moldboard of the trailbuilder can easily be angled to the right or left on the single king pin by removing two landside pins, swinging the blade to the desired side, and replacing the landside pins which hold it rigidly in place. The double trunnion mounting makes it possible to tilt either end of the blade 12 inches by attaching one push arm to the top trunnion on one side while the other arm is mounted on the lower trunnion on the opposite side.



Buckeye Bulldozer

The horn and push frame which have been completely redesigned are fabricated from heavy steel welded box-beams to provide maximum strength. The rugged construction of the moldboard is another of the exceptional features of the new dozer. Welded v-shaped vertical braces and heavy steel plate horizontal cross pieces reinforce the blade so that it can withstand the toughest bulldozing operation. Moldboard is fitted with reversible cutting edge and replaceable corner bits.

The new dozer is track mounted with the weight evenly distributed over the crawler shoes to provide maximum traction. Single or double drum Buckeye power control units provide the necessary power.

Caterpillar Tractor Company Has New Canadian Representative

Albert Olson, owner of Albert Olson Company, Ltd., retired on July 1, 1944, after representing Caterpillar Tractor Company in the Saskatchewan territory for almost 20 years.

Kramer-Church Tractor Company, Ltd., Regina, will represent the company in this territory. Both members of the new concern have been in the machinery business for some time, Clarence H. Church having represented Caterpillar in Canada for a number of years, first as a member of the credit department and later as district representative for the sales department. For the past year he has been Northern division manager of Union Tractor & Harvester Company at Edmonton, Alberta. R. A. Kramer was formerly in the contracting business, having been a member of the firm of Mannix and Kramer, which withdrew from business approximately 18 months ago.

Houston Oilfield Material Opens Store at Fullerton

Houston Oilfield Material Company announces opening of a new store to serve the Fullerton field in Andrews County, Texas. The store is being managed by W. K. Mills. The Odessa branch store is now under the supervision of H. J. Moon. L. L. Talley is West Texas district manager.

W. K. Mills

L. L. Talley

Teeple Joins International Nickel Company Corrosion Study Staff

H. O. Teeple, chemical engineer, has joined the Technical Service Group of the Development and Research Division of The International Nickel Company, at New York, T. H. Wickenden, manager of the division, announces. He will specialize in corrosion problems.

After graduation from the University of Michigan in 1937, Teeple became associated with the alkali and chlorine products industry, remaining there until coming to International Nickel Company. He has had experience in production, process control, and maintenance engineering, including equipment specifications, corrosion control and the use of metals, alloys, plastics, and special paints.

Pressure Maintenance

Clark Brothers Company, Olean, New York, has published in bulletin style, "A Method for Evaluating Pressure Maintenance." This paper was presented before A.I.M.E. at Los Angeles in October, 1942, by N. van Wingen, the author. The company presents the study as a "very clear and concise picture of the value of gas conservation and pressure maintenance."

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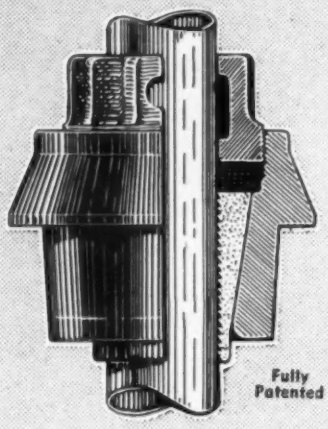

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JAY W. OWINGS, has rejoined The Youngstown Sheet and Tube Company, Youngstown, Ohio, as assistant manager of tubular sales. He has been serving as deputy chief of the pipe branch of the steel division of the War Production Board at Washington for the past two years. Owings was with the company 14 years before joining WPB, spending 8 years in the metallurgical department and 6 years in field service, specializing in inspecting and distribution of oil-country tubular goods. He was superintendent of field engineers of the tubular division just before joining WPB.

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